

How to Erect Your
**Wardway
Ready-Cut
Home**



Montgomery Ward Co.
Satisfaction Guaranteed or Your Money Back

World-Wide Distributors of Quality Merchandise
Operating Nine Great Mail Order Houses
and Hundreds of Retail Stores

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Grounds and Backing.....

Cellar Stair Treads.....

Sill Plates.....

Porch Joists.....

Sill Plates.....

Shingles.....

Joists.....

Flooring.....

Siding.....

Lath.....

Subfloor.....

Shiplap.....

Cripples and Trimmers.....

Roof Sheathing.....

Rafters.....

Ceiling Joists.....

Studs.....

Scaffolding.....

Wall Plates.....

Outside Stair Horses.....

Girders and Posts.....

Inside Stair Blocks.....

Extra Blocking.....



CORRECT METHOD OF PILING LUMBER

This is only an example to illustrate that each kind should be kept separate. It is not necessary that location of piles be in the exact locations shown in the illustration.

How to Erect a Ready-Cut Home

*Read These Instructions Very Carefully Before
Starting Any Work*

1—FOREWORD

You are entering into a pleasant enterprise, the erection of a Wardway Ready-Cut Home. In order that this experience be a thoroughly satisfactory one in every respect, we have made an effort to place in your hands in a simple, understandable way the combined knowledge of all of our experts.

These instructions are the net result of a great deal of experience and thoughtful care. The blue prints represent the best work of the architects and engineers who have made the highly perfected Montgomery Ward & Co. Ready-Cut System of today possible.

By following these plans and instructions faithfully, step by step, the building will grow surely and rapidly. The result will fully measure up to your mental picture of this new home.

It will be our aim, through service intelligently and sincerely rendered, to make your experience with the Montgomery Ward & Co. Ready-Cut system a thoroughly satisfactory one. The simplicity and logical sequence of each step in the erection of this home will impress you. These instructions are the direct results of a continuous effort on our part to so improve our system that your experience, and the experience of others, will stand as ample proof of Montgomery Ward & Co's. mastery in the home building field.

No matter how many buildings you have erected, if you have not built a Wardway Ready-Cut Home, it is absolutely necessary that you read these instructions through before any of the work is started. It may be that the construction of our homes differs from that which you are accustomed to, but if you are to get the greatest benefit from our service, **these instructions must be followed very carefully.** This will not only simplify the erection of the building, but will save time and labor. It will prevent you from making any mistakes.

Our construction is substantial and strong. We know this because thousands of Ready-Cut Homes have been built satisfactorily with our material and from our Drawings and Instructions. These homes have stood, and are standing, the test of time. Therefore, have no hesitation about following our construction in every detail.

Should you at any time hesitate about the correct way of going ahead with your building, we ask that you notify us and we will be glad to advise you or furnish any information you may request. We believe, however, that this will not be necessary if these Instructions and the accompanying Blue Prints are studied and followed with care.

2—INDEX

- Carefully Indexed** (a) This instruction book has been very carefully indexed. By turning to the index you can find out immediately just which paragraph explains the particular part you are interested in.
- What Parts to Read** (b) It is not necessary that you read or follow those portions which tell of materials and constructions which are not a part of your home. For instance, if your foundation is to be of concrete blocks, do not bother to read the parts telling about poured concrete or hollow tile.
- Refer to Index** (c) We urge you to use the index freely, because it will save you lots of time.

3—BLUE PRINTS

- Simple Blue Prints** (a) At first glance the blue prints may appear to be complicated, but if you will consider only one drawing at a time and follow one drawing after another—reading, at the same time, such parts of these instructions as refer to the drawing you are working from—the whole building will go forward step by step in an orderly and natural manner.
- Each Piece Marked** (b) The blue prints show clearly where each and every piece of framing lumber is to be used. The mark or brand of each piece is shown on the drawings and each piece (or bundle) of lumber is marked in the same way, so that you can very easily find its proper place.
- Follow Measurements** (c) Follow the figures and measurements which are shown on the drawings. Do not measure anything with a rule or scale if a measurement is given. There may be a slight variation, and the measurements shown are correct.
- Clear Blue Prints** (d) Keep the blue prints in the shade, not exposed to the direct sunlight, or they will fade and be hard to read.
- Reversed Blue Prints** (e) When a house is to be furnished with the room arrangement reversed from the way it is shown in the Book of Homes, a reversed set of blue prints is furnished. This reversed set of blue prints shows all parts of the house reversed, as they should be. The letters and figures are also reversed—that is, they read backward. For this reason we also include a set of regular blue prints to read from.

4—UNLOADING THE CAR

- Important** (a) **The proper unloading of the lumber from the car and the proper piling of it on the ground is of the greatest importance.** If you cannot attend to this in person, be sure to give careful instructions to those who do.
- Checking Lumber** (b) When loaded into the car, each kind of material was kept separate, as much as possible. All of it was checked three times before it was loaded into the car. When your car arrives you can, therefore, be reasonably sure that materials in sufficient quantity and number have been included. As the lumber is unloaded a careful recheck should be made. To assist you we have given you a complete list of all ready-cut framing lumber and a tally sheet covering the balance of lumber such as sheathing, flooring, boards, etc. Both the board footage and number of pieces is indicated, making it a very simple matter to check the shipment.

In unloading the car, do not mix the lumber all up, but keep each different kind of material by itself as much as you possibly can. This will save you the labor of re-sorting this material later on. Each piece of lumber is marked and branded for the purpose for which it is intended, such as FIRST FLOOR JOIST, STUD or SILL PLATE, and this will help you to keep the various kinds of lumber separate.

(c) Separating Lumber

Finish hardware, doors, windows, inside trim, outside finish lumber, siding and finish flooring **must be placed under cover**. If you have sufficient space, it is well to put all material under cover. But, with the exception of the items just mentioned, all lumber can be piled outside if **carefully covered** with the water-proof paper, which we furnish for this purpose.

(d) Protect Finish Material

If siding, outside finish lumber and flooring have to be piled out in the open, particular care should be taken to keep them up off the ground. In other words, set them up on blocks. Cover them thoroughly with water-proof paper and tack this on with lath. Unpainted lumber is very liable to warp, twist and crack if not properly cared for.

(e)

Bundles of shingles, either wood or asphalt, must be piled flat so that the water does not run into the bundles and discolor the shingles.

(f)

Piling Shingles

5—PILING LUMBER

The correct piling of the lumber is most important. See the picture at the front of this instruction book. **Pile each kind of lumber in a separate pile.**

(a)

Clear a space around the building large enough so that you can pile the lumber of each kind in a separate pile. Keep the First Floor Joists in one pile, the Studs in another, the Rafters in another, and so on. Do not mix it all up, for if you do you will spend useless time in constantly turning over the piles to find each piece. This useless work can easily be avoided if you will sort and pile each kind of lumber by itself to start with. This correct way takes but little longer than dumping it all in one pile.

(b)

Keep Each Kind of Lumber by Itself

You will find it more convenient in locating pieces if you pile the lumber so that the ends of the lumber are toward the building, with the mark or brand **on top**.

(c)

Pile with Mark on Top

6—LAYING OUT THE BUILDING

Secure a steel tape to do all measuring with, if at all possible. It is much more accurate than anything else. Also secure a spirit level to use in leveling and plumbing.

(a)

Steel Tape Spirit Level

First locate some line which the house is to be parallel to and which is already established, such as a property line, sidewalk, fence or some other building. This is represented by line A-B in the diagram on next page. (See Figure 1.)

(b)

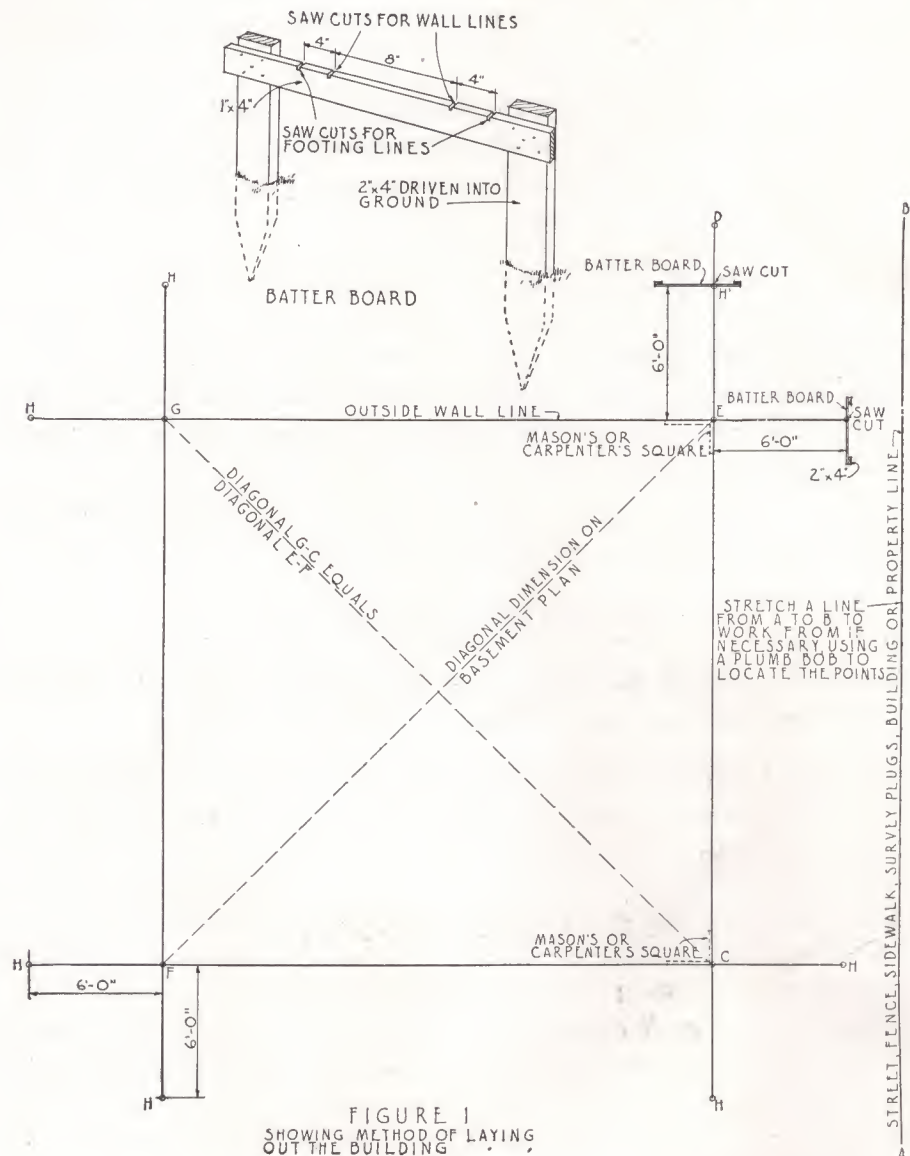
Locate the point where you wish the corner C of the building to be. Drive a stake into the ground at this point and drive a nail into the top of of the stake. This nail is then the exact location of point C.

(c)

Locating First Corner

**Locating
First Side**

- (d) Measure the distance from C to line A-B, holding the tape tight and at right angles to line A-B. Measure this same distance from line A-B to D. (Point D is any distance beyond the building.) The longer the lines A-B



and C-D are, the more accurate the layout will be. Hold the tape **level** and also at **right angles** to line A-B. Drive a stake at D and a nail in the top for the exact location of Point D. Stretch a line from C to D.

**Locating
Second Corner**

- (e) Locate point E by measuring, along line C-D, the exact distance shown on FOUNDATION PLAN. Drive a stake and set a nail in stake at E. Line C-E is the outside line of the foundation wall.

**Locating the
Second Side**

- (f) At the corner C, set a mason's or carpenter's square, with one side in line with C-E. Stretch the tape from C to F, a distance equal to the other side of the building. Hold the tape tight and in line with the other side of the square. Drive a stake and set a nail in it at this point F.

Measure the distance from F to E. If this diagonal measurement is not the same as the one shown on FOUNDATION PLAN, move the nail on Stake F until it is and drive into stake at the exact point. (g) **Squaring the Foundation**

Locate point G from E in the same manner. Stretch lines G-E and G-F. (h)

All of these outside lines of the building should measure exactly the same as shown on FOUNDATION PLAN. If not, move points E, F and G slightly until they do. The diagonal line G-C should measure the same as F-E. (i) **Checking the Measurements**

As all of these stakes will be knocked out in excavating, it is necessary to locate these lines more permanently. Extend the lines already found to points H, about six feet beyond the foundation. At these points H, set up batter boards (see Figure 1). Put a saw cut across top of batter board where the building lines cross the batter boards. By stretching lines between these sawcuts at H the outside lines of the building can be located at any time. The inside lines of the foundation wall and lines of footings can also be laid off on the batter boards very easily. This will **keep all parts of the foundation square**, which is absolutely necessary. (j) **Permanent Stakes**
Batter Boards

Any projections from the square of the house, such as porches, projecting rooms and bay windows, can be laid out in exactly the same manner as described above. Check the correctness of these by using the diagonal dimension, when shown on the FOUNDATION PLAN. (k)

If the batter boards are all set at a uniform height—for instance, at the line of the top of the foundation—they will serve as a top line to which the top of the foundation can be built. (l)

7—EXCAVATING

In excavating or digging for the foundation, be very careful to dig only to the depth shown on WALL SECTIONS, so that the footings will all set on solid ground. It is very dangerous to build on top of filled ground, made necessary by digging too deep and filling back to the required depth. If you should dig too deep in some parts, fill up to the correct height with concrete—not loose earth. (a) **Depth of Excavation**

Excavate or dig out for the basement to the size and depth you have laid out. Follow the measurements shown on BASEMENT PLAN and WALL SECTIONS. Make the excavation about one foot larger than the finished foundation will be, so that the footings can be put in easily and so that the wall can be built clear of the excavation. This will also allow filling up and pointing the joints on the outside of the wall with mortar. This is very necessary to secure a tight and water-proof wall. (b) **Size of Excavation**

Dig trenches for the footings of the walls, posts and chimneys. Be careful to have these of the exact size and locations as shown on BASEMENT PLAN and WALL SECTIONS. The walls, posts and chimneys must rest exactly in the center of the footings (see Figure 2 on following page). (c) **Footings**

If the trenches for the footings are dug to the exact size it is not necessary to build the sides of form lumber (see Paragraph 8-b and Figure 3).

Porches

- (d) Also excavate for area walls around basement windows, porch piers or other walls which are outside of the main foundation in a similar manner to the above. Usually it will be more convenient to do this after the main foundation has been built.

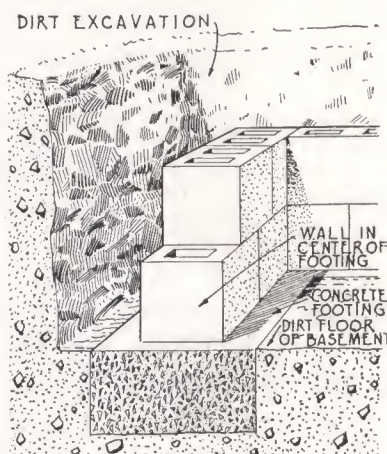


FIGURE 2
CONCRETE FOOTING
IN DIRT TRENCH

Trenches

- (a) The footings under walls, piers, posts and chimneys are to be of poured concrete.
- (b) If the trenches for the footings are not square and true and the exact sizes shown on FOUNDATION PLAN and SECTIONS, and as described in Paragraph 7-c, build the sides of the trenches up with planks. These planks are to be nailed to stakes driven in the earth (see Figure 3).

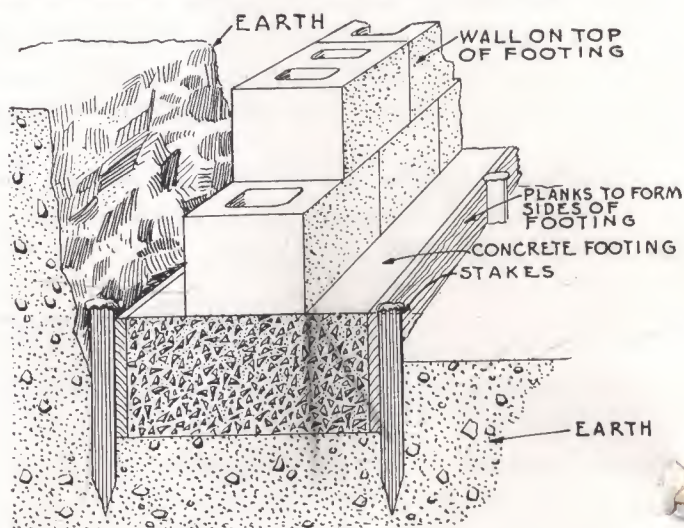


FIGURE 3
CONCRETE FOOTING IN A
WOODEN TRENCH

Material Used In Concrete

- (c) All concrete for walls and footings is to be composed of five parts of clean, hard stone and two and one-half parts of clean sand and one part of Portland cement. To this is to be added seven and one-half gallons of water to each sack of cement.

- (d) The broken stone should not be smaller than $\frac{3}{8}$ of an inch, or larger than $1\frac{1}{2}$ inches.

Clean river gravel of the same sizes may be used in place of stone.

- (e) Keep cement out of the rain and free from moisture or it will set and become hard. Do not use any cement which has set.

Measuring the Material for Concrete

- (f) Measuring and mixing should be done carefully. Do not measure it by the shovelful. A simple way of measuring is to make a box $12'' \times 12'' \times 12''$, without a bottom but with handles (see Figure 4). This box will hold a cubic foot. Use it as a measure for "one part." A sack of cement contains about one cubic foot.

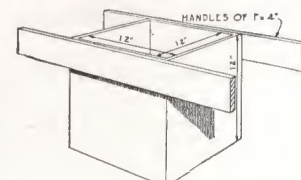


FIGURE 4
BOX FOR MEASURING A CUBIC FOOT

Mixing the Concrete

- (g) Mix the one part (a sack) of cement with the two and one-half parts (two and one-half boxes) of sand. Then add the five parts (five boxes) of broken stone

or gravel. Mix all of these together thoroughly, while dry, until the entire mass is of an even uniform color. Pour in the water and mix again.

If you have a concrete mixing machine, use it in place of mixing by hand. (h)
It will mix the concrete easier and more thoroughly.

Mix the concrete in small batches and use while it is still fresh. (i)

Pour the concrete into the footing trenches until it fills them completely (j)
to the top. Ram it down and spade it out so that no air or stone pockets
will be left.

Be sure that the footings are set hard before starting to build the founda- (k)
tion walls on top of them.

If an eight-quart pailful of hydrated lime is added to each sack of cement, (l)
the cement will work easier and will make a more water-proof wall.

Pouring
Concrete
Footings

Lime

9—FOUNDATION WALLS, IF BUILT OF POURED CONCRETE

If lumber cannot be rented for forms, it will be necessary to purchase (a)
some cheap lumber locally. Do not use the house lumber, as it will get dirty
and you will not be able to read the brands or stencils on it. Also it will get
mixed up.

Forms

Build forms of 1-inch smooth lumber nailed horizontally to 2"x4" up- (b)
rights spaced not over 24 inches from center to center. These forms must
be carefully located and securely braced in proper position for all foundation
walls, as shown on FOUNDATION PLAN and SECTIONS (see Figure 5).

Building
Forms

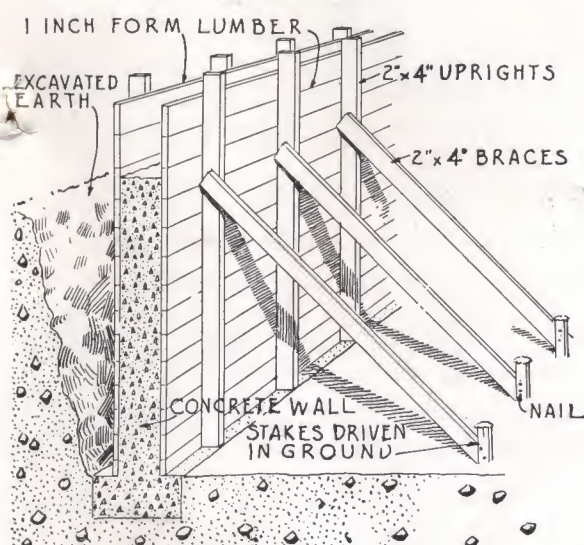


FIGURE 5
SHOWING FORMS FOR CONCRETE
FOUNDATION WALL

The braces shown in Figure 5 (c)
are only intended to hold the
sides of the form vertical and the
mass of wet concrete contained
between them in a plumb and
secure manner until the concrete
has set. The two sides of the
forms should be tied or held to-
gether as shown in Figure 6.

Bracing
Forms

In Figure 6 the separator "A" (d)
consists of a small stick of
smooth wood cut to the exact
length of the width of the wall.
Close to it is placed the tie "B,"
of No. 18 gauge soft steel wire.
This is formed in a V shape,
passed around the upright "C,"
through holes in the forms and

Tying Forms
Together

twisted around the upright "D." Tighten this wire by twisting the wires with a 16-penny spike.

Removing Forms

- (e) When the concrete is poured in and has reached the top of a separator "A," fish out the separator with a stick. When the forms are removed cut off the ends of the wire ties.

Setting Cellar Frames

- (f) Cellar frames, as shown and located on the BASEMENT PLAN and SECTION should be set into the forms as they are built. As the frame is not the full thickness of the wall, a piece of smoothed lumber (see A and B in Figure 7) should be tacked to the frame to fill it out to the full thickness of the wall. The Cellar Sash Frames, however, should not be set into the forms until the concrete has been poured almost to the bottom of where the Frame is to set, otherwise it will be difficult to push the concrete fully under the Sash Frame.

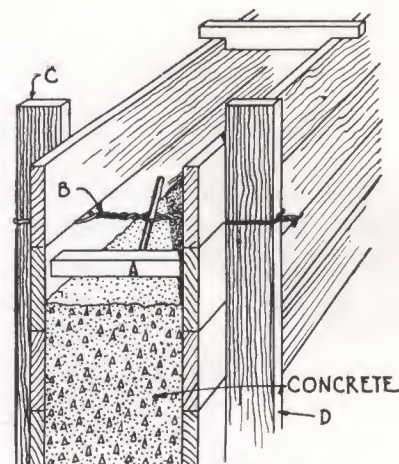


FIGURE 6
SHOWING TIES AND BRACES
IN FORM FOR CONCRETE WALL

Opening for Girders

- (g) Be sure to leave openings in the top of the wall for the ends of girders to rest in, as shown on BASEMENT PLAN. These openings to be 4 inches deep, 6 inches wide, and 6 $\frac{3}{8}$ inches high. (See Figure 12, on page 16.)

Making Concrete

Pouring Concrete

- (h) The concrete should be composed of the same materials and mixed and poured in the same way as described in Paragraph 8. Pour it only in layers from 6 to 12 inches thick at a time. Ram this thoroughly and spade it out so that no air or stone pockets will be left in the wall.

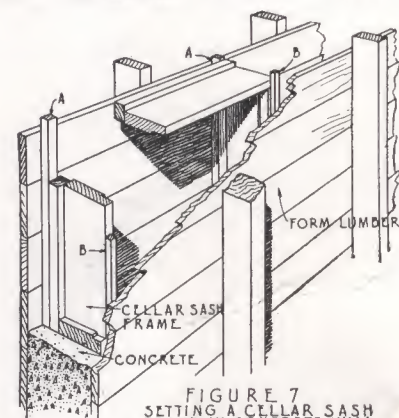


FIGURE 7
SETTING A CELLAR SASH
FRAME IN CONCRETE WALL

In Freezing Weather

- (i) Concrete must not be poured during freezing weather, unless provision is made for keeping it from freezing. If it is poured in hot weather, keep it covered from the direct sunlight so that it will not set too fast.

Finishing Walls

- (j) Whenever poured concrete walls are exposed to the weather above the ground they should be given a smooth finish of Portland cement. This Portland cement finish is composed of one part of Portland cement and two parts of sand thoroughly mixed together. Enough water is then added so as to make it work well. The wall is then plastered with it to a thickness of about one-half of an inch.

Finish of Footings

- (k) The footings and foundation wall exposed to view in the basement can also be smoothed up in the same way.

Area Walls

- (l) When cellar windows are below the grade line, they should be protected with area walls; that is, two concrete walls extending from each side of the window at right angles to the basement wall, and joined by another concrete wall about two feet from the window. These area walls are indicated on the plans where needed.

In building basement window areas it is advisable to set two anchor rods $\frac{3}{4}$ "x18" into the foundation wall where the area wall joins it. Let these anchor rods be flush with the inside of the wall and project out into the area wall. The rods set one over the other, one about 6 inches below the top of the area wall and the other about 8 inches below it. These anchor rods, if used, must be purchased locally. (m)

Anchor Rods
for Areas

If the house sets in a moist soil or one in which considerable drainage may work through toward the basement, it will be advisable to damp-proof the foundation wall. Apply a regular integral water-proofing, such as the Seal-Tite Water-Proofing listed in our large General Catalogue, on the outside of the wall with a long handled brush in accordance with the manufacturer's directions. No water-proofing is to be applied until the concrete wall has dried out thoroughly. A good coating of asphalt paint or tar (see General Catalogue) is also a satisfactory water-proofing. (n)

Damp-Proofing
The Basement

If the cellar walls are not completed in one day, the surface of the older material should be roughened and washed clean before continuing. Particular care should be exercised to see that the new material is thoroughly rammed up against the old surface. (o)

Joining
Concrete

10—FOUNDATION WALLS, IF BUILT OF CONCRETE BLOCKS

Build the foundation walls from the top of the concrete footings up to the sill plate of concrete blocks, not less than 8 inches thick. These blocks should be of such manufacture and materials as to make a satisfactory block for the purpose, and must comply with the City Ordinance, if there is one. (a)

Kind of
Blocks

All blocks shall be laid with the holes or voids vertical. Specially made corner blocks are to be used at all corners. Proper care should be taken to butter the vertical joints of the blocks with mortar, so as to give a moisture-proof wall. Each course of blocks to be laid with joints broken in each alternate course. Blocks should be placed on beds of mortar at the inside and outside faces of the wall. Where two walls join at right angles to one another, be sure to run every other block **through** the wall joining it, so as to make the joint between the two walls perfectly solid and secure. (b)

Laying

Use cement mortar for laying the blocks, as described in Paragraph 17. (c)

Mortar

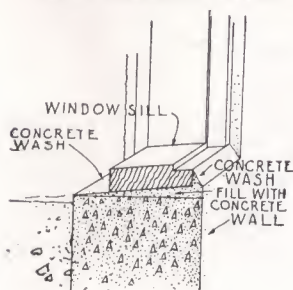


FIGURE 8

The blocks below the grade should have a smooth surface for both inside and outside faces, but those exposed above the ground may have a rough finish (rock face) on the outside. (d)

Finish of
the Blocks

Where windows or sash occur in the walls make a neat bevel up to the sill, of concrete, both on the inside and outside (see Figure 8). (e)

Finishing
Window Sills

Be sure to leave openings in the top of the wall for the ends of girders, as described in Paragraph 9-g. (f)

Girder
Openings

If the house sets in a moist soil or where considerable drainage may work through toward the basement, it will be advisable to damp-proof the foundation wall, as described in Paragraph 9-n. (g)

Damp-
proofing the
Basement

- Concrete Areas** (h) If basement window areas are built of concrete it is advisable to put in anchor rods, as described in Paragraph 9-m.

11—FOUNDATION WALLS, IF BUILT OF HOLLOW TILE

- Kind of Tile** (a) Build the foundation walls from the top of the concrete footings up to the sill plate of glazed hollow building tile, not less than 8 inches thick. These tile should be of such manufacture as to make a satisfactory tile for the purpose, and must comply with the City Ordinance, if there is one. Do not use any cracked or broken tile.
- Laying** (b) All tile shall be laid with holes or voids horizontal, except that corners and jamb tile shall be vertical to give closed ends at the corners and openings. Proper care should be taken to butter the vertical joints of the tile with mortar, so as to give a moisture-proof wall. Each course of tile shall be laid with joints broken with the alternate courses. Tile should be placed on beds of mortar at the inside and outside faces of the wall, which will leave a dead air space between the two beds of mortar. Where two walls join at right angles to one another, be sure to run every other tile **through** the wall joining it, so as to make the joint between the two walls perfectly solid and secure.
- Mortar** (c) Use cement mortar for laying hollow tile, as described in Paragraph 17.
- Setting Cellar Frames** (d) Window or sash opening shall be formed by using jamb tile and half jamb tile. The jamb tile is the same unit as is used for the corner, while the half jamb is a tile made to lay vertically and give a closed end to place against the window frame. Both of these tiles are slotted at one end for the insertion of a wooden strip, to be nailed to the side of the frame. If this strip is well mortared to the wall it will make a tight joint between the wall and the frame.
- Girder Openings** (e) Be sure to leave openings in the top of the wall for the ends of girders, as described in Paragraph 9-g.
- Damp-Proofing the Basement** (f) If the house sets in a moist soil or where considerable drainage may work through toward the basement, it will be advisable to damp-proof the foundation wall, as described in Paragraph 9-n.
- Anchor Rods for Areas** (g) If basement window areas are built of concrete it is advisable to put in anchor rods, as described in Paragraph 9-m.
- Area Walls** (h) The area walls should be built at least 6 inches thick and should extend at least 4 inches above the established grade line and from 10 to 12 inches below the bottom of the area. It is a good practice to place a few light reinforcing rods in the concrete walls to avoid cracks resulting from settlement and temperature changes. The concrete should be composed of the same materials and mixed and poured in the same way as described in Paragraph 8. An area drain is not essential. Drainage from the area is best provided by laying the area floor of loose bricks placed on a bed of sand and gravel.

12—REINFORCED CONCRETE

Where re-inforced concrete is shown on the drawings, it should be composed of four parts broken stone, two parts sand and one part of cement, and should be very carefully mixed together. Use six gallons of water to a sack of cement.

If the steel bars or rods used are covered with a loose or scaly rust, dirt or cement drippings, they should be cleaned with a wire brush. Be very careful to secure the correct sizes and kinds of rods, and set them and tie them together as described in the notes on the SECTIONS.

(a)
Materials Used
In Reinforced
Concrete

(b)
Steel Bars
and Rods

13—CONCRETE BASEMENT FLOOR

Provide a floor drain with proper trap which connects with sewer. Slope the entire concrete basement floor to this drain. Give the floor enough pitch so that all surface water will run easily into this drain.

After all underground pipes have been laid and properly tested, fill in the pipe trenches, tamp hard and grade the basement level. On this lay a concrete floor not less than 3 inches thick, composed of one part of Portland cement to two parts of sand and four parts of crushed stone or clean washed gravel. Use about 6 gallons of water to each sack of cement. Tamp the floor well and trowel it smooth with a steel trowel or float.

(a)
Floor Drain

(b)
Mixture of
Concrete

How to Lay

See Paragraphs 8-d, 8-e, 8-f, 8-h and 8-i for the proper method of mixing concrete.

(c)

14—FILLING AROUND FOUNDATION

As soon as the foundation has set **hard**, fill back the earth around the outside of the walls. Be sure that there are no shavings or wood in this fill. This must not be done until the foundation has **set hard**, or you may push in the foundation wall. In back filling, place the earth in layers not more than 1 foot thick. Tamp each layer hard and settle it with water. This prevents air pockets, which eventually fill with surface water that is later bound to seep under and through the foundation, and not only weaken it, but cause water to form in the cellar.

(a)
Backfilling

If the soil is a soft clay it will be well to brace the walls on the inside while filling. Place a wide board about 2 feet long against the wall, about half way up. Brace a 2"x4" diagonally against this board. Drive a stake into the ground about 5 feet from the wall and wedge the 2"x4" brace between the stake and the board on the wall. Nail sufficiently to keep the brace in place. See the braces shown in Figure 5.

(b)
Bracing Walls
While Filling

15—GRADING

Slope the earth away from the building, so that storm water will run away from and not into the foundation. The final finish grading can be done later when the lawn is seeded.

(a)
Rough
Grading

- Grade Line** (b) The grade line shown on SECTIONS and ELEVATIONS is the finished grade after final completion of the building. This may be varied to suit the particular requirements of the ground on which the house is built; in which case, however, it will be necessary for you to cut off or lengthen any porch steps to correspond.

16—BRICKWORK

- Laying Brick** (a) All brick should be sound, hard and well burned brick.
- Header Course Wetting Bricks** (b) Bricks are to be laid in a careful manner and to a line on both sides in a full bed of mortar. Bricks shall be buttered with mortar on the end and shoved into place. All vertical joints to be thoroughly filled with mortar. Joints to be plumb or level, as the case may be, and they should be of a uniform thickness. All brickwork in walls must be bonded together by using a header course at least every seventh course. In warm weather bricks should be soaked in water before laying. In cold weather they should be used dry.
- Laying in Cold Weather** (c) When the temperature is below freezing or likely to fall during the night, all materials, including the water, must be heated before using. No bricks with ice or snow on them and no frozen mortar shall be used. The mixing of salt in the mortar, to check freezing, should be absolutely prohibited.
- Protecting Brickwork** (d) At no time during work should any face brick be carried more than approximately six courses above the brick backing behind, and both shall be brought level every night and well covered with building paper, planks, or the like, to protect it against damage.
- Mortar** (e) All brickwork in the cellar, brick copings or tops of areas, brick porch floors and steps, should be laid in cement mortar. Lay such parts of the chimney or other brickwork as are exposed above the roof or on the exterior of the building in lime-cement mortar, and any other brickwork above the grade in lime mortar. See Paragraph 17 for mixtures of mortar.
- Area Floors** (f) Pave floors in areas for basement windows, if any, with one layer of brick laid in 6 inches of sand, without mortar, as shown on SECTIONS.
- Chimneys Flue Linings Ash Pit** (g) Flues in chimneys are to be lined with fire clay tile flue lining of such sizes as are shown on the drawings. These linings shall start at least 4 inches below the bottom of smoke pipe, or from fireplace throat, and continue, without break, to the top of the flue. These linings must be cut accurately to fit all angles of flues and thimbles and openings. Lay them in lime-cement mortar, with the joints pointed smoothly on the inside. In no case should more than three courses of brick be laid above the top of a flue lining before the next one is set in. Build the brick around the flue lining as it is set up, being careful to slush the joint between lining and brickwork full of mortar. The ash pit should be paved with brick. Provide a thimble of proper size for furnace or boiler flue in basement.

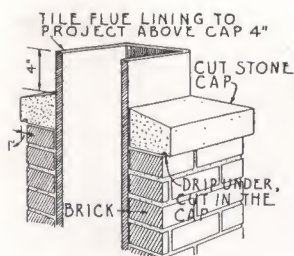


FIGURE 9
SHOWING CHIMNEY CAP

It is advisable to cap all chimneys with a solid one-piece stone or cast concrete cap about 4 inches thick, with a projection over the face of the chimney of 1 inch, and with holes cut in it the exact sizes of the flues. This cap should have a water drip cut in on the under side of the cap (see Figure 9).

Tin flashing shingles are furnished, which are to be cemented into the joints of the brickwork where the chimney joins the roof. These form a counter-flashing which are later bent down over the flashings set between the shingles on the roof (see Figure 10).

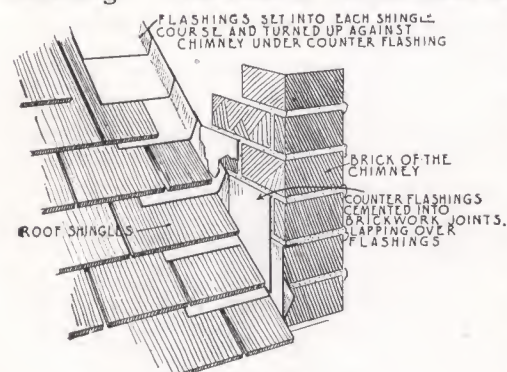


FIGURE 10

If a fireplace is shown, it is to be laid up in accordance with the Drawings and Details. The face brick, exposed in the room, to be of such kind and color and laid in such colored mortar as may be selected by the owner of the building. The hearth to be laid in cement mortar with flush joints, finished smooth. Back hearth (or floor) and lining of the fireplace opening to be of hard burned fire-brick and laid with a narrow joint of fire clay.

While a dome damper is furnished for all fireplaces, it is advisable to build in a steel angle over the opening also, about 6 inches longer than the opening. An ash trap is furnished, which is to be set in the floor of the fireplace

and flush with the top of it. Set this so that it will empty into the ash pit below. A clean-out door and frame is furnished for ash pits under fireplaces. Build this into the fireplace ash pit, near the bottom.

After the plastering has all been done, all face brick of the fireplace should be cleaned by scrubbing the brick with muriatic acid and water. Use one part acid to fifteen or twenty parts of water. After all spots and stains have disappeared rinse with clean water. At this time all defective joints are to be carefully pointed up. It is well to also test all flues to see if the draft is satisfactory, and clean out the flues and ash pits.

17—MORTAR

Cement Mortar is composed of one part Portland cement and three parts of clean sharp sand.

Lime-Cement Mortar is composed of one part Portland cement, one part lime putty, or hydrated lime, and six parts of clean sharp sand. Lime putty is made from quicklime completely slaked. Dry hydrated lime is better to use than lime putty. This lime-cement mortar should be used within two hours of the time the cement has been added.

Lime Mortar is composed of one part lime putty, or hydrated lime, and three parts of clean sharp sand.

(h) Chimney Cap

(i) Flashing Chimneys

(j) Fireplace

(k) Dome Damper

Steel Angle

Ash Trap

Clean-Out Door

(l) Cleaning Face Brick

(a) Cement Mortar

(b) Lime-Cement Mortar

(c) Lime Mortar

- Cement or Lime-Cement Mortar** (d) Where cement mortar is mentioned in the previous paragraphs for use in basement walls below grade, lime-cement mortar may be used. Lime-cement mortar is preferable to cement mortar for use in cold weather.
- Mixing Mortar** (e) "Parts" given in the above mixture are parts by volume and not by weight. See the method of measuring quantities of sand, cement and lime as described in Paragraphs 8-e, 8-f, and 8-g. All material used in the mortars must be thoroughly mixed together until the whole mortar is an even, uniform color.
- Mortar Color** (f) If mortar color is used in laying face brick, it should be mixed into the mortar very thoroughly until the mortar is all of an even, uniform color throughout. Follow the directions given on the package.

18—BASEMENT POSTS AND GIRDERS

- Setting Posts** (a) Locate the 6"x6" girder-posts in the exact position, as shown by the measurements on the BASEMENT PLAN. Brace the posts temporarily until the girders are in place. These posts are branded or marked POST. All girder-posts are furnished uncut, so after you have them braced, cut the tops of all posts off in true level lines, even with the lines of the bottoms of the girders.
- Setting Girders** (b) Pick out the proper girders, each of which is marked GIRDER, for each place, as shown on the SILL and GIRDER PLAN. Lay the girders in position, allowing ends of them to set $3\frac{1}{2}$ inches into the openings left in the walls for girders. Set the girders so that the joints between them will center exactly on the posts. Spike ends of girders together thoroughly and spike girders down to posts, as shown in Figure 11. Use 16-penny nails.
- Crown In Girder** (c) You may find that the girders have a crown to them—that is, they curve slightly, being higher in the middle than on the end when the piece is placed on edge. They must be placed with the crown on top, so that the girder is higher in the center than at the ends.
- Girder Tie** (d) Nail a piece of 1"x8" on each side of all joints to further tie girders together (see Figure 11).
- Top of Girder Even with Top of Sill Plate** (e) If post footings and foundation wall have been built and posts located in accordance with the drawings, the top of the girder will be $1\frac{5}{8}$ inches higher than the masonry wall. This is so that the top of the girder will be even with the top of the sill plate when it is laid (see Figure 12).

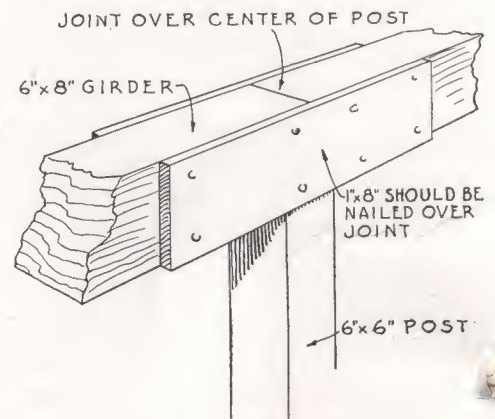


FIGURE 11
SHOWING BASEMENT POST AND GIRDER

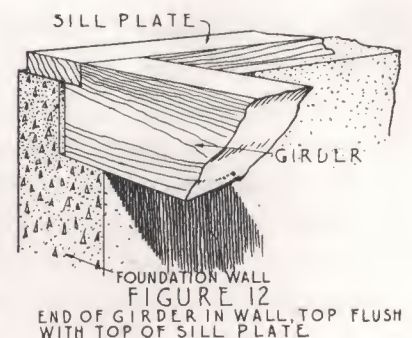


FIGURE 12
END OF GIRDER IN WALL TOP FLUSH WITH TOP OF SILL PLATE

19—SILL PLATES

Before proceeding further, measure all sides of the foundation at the top of the wall very carefully. Check it back by measuring the diagonal dimensions again, as described in Paragraphs 6-g and 6-i. If it is not exactly as it should be, correct the mistake by running a line exactly where the outside edge of the foundation should be. When laying the sill plate, consider this line as the outside of the foundation. If these instructions are not followed carefully the various parts of the building will not fit together properly.

Lay the sill plates, which are 2"x6" and branded SILL PLATE, in the locations shown on SILL and GIRDER PLAN. Be very careful to place them $\frac{3}{4}$ inch back from the outside face of the foundation wall (see Figure 13). The outside line of the sill plate is the outside of the framing line, and all dimensions above the foundation run to this line. In other words,



FIGURE 13
SILL PLATE ON WALL

the sill plates must have square corners with the sides of the building. Lay the sill plates true to a line, in order that it will not be necessary to use any other line for the ends and side of floor joist or plates above.

After bringing the sill plate to a perfect level, fill in under it with cement mortar. Bed the sill plate thoroughly, so that no spaces occur between it and the wall.

The end of girder is notched so sill plate can set over it (see Figure 14).

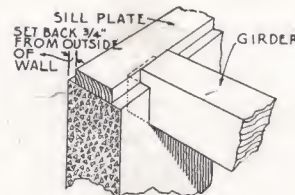


FIGURE 14
SHOWING GIRDER CUT
OUT FOR SILL PLATE

(a) Laying
Sill Plate
Lay to a Line

(c) Mortar Bed

(d) Girder End

20—STUDS TO GRADE

This construction is used only on a few houses. It is used when the foundation wall projects only a few inches above the ground but where the floor joist are about two feet above the ground.

On top of the sill plate build 2"x6" studs, 16 inches on centers, to form a low wall, as shown on drawings. Use the studs marked for that purpose. Cap these studs with another 2"x6" plate (see Figure 15). Short posts are shown on the drawings and furnished to place on top of the sill plate, under the ends of the girder. The first floor joist, in this construction, will rest on the top plate of this 2"x6" stud wall.

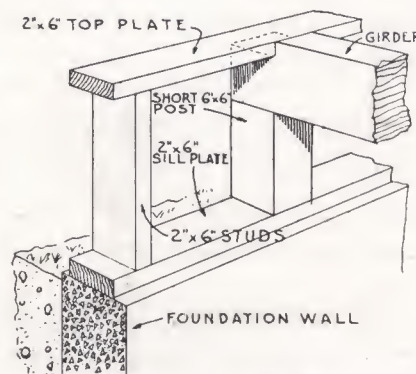


FIGURE 15.
STUD WALL, WHEN USED,
BELOW FIRST FLOOR.

(a) When Used

(b) 2"x6" Studs

Top Plate

Girder End

21—FIRST FLOOR JOISTS

Laying Box Sill

- (a) The box sill is a joist which is put on the two sides of the building and across the outside ends of the joists (see Figure 16). Pick out the proper pieces from the pile of first floor joists, with numbers on them to agree with the ones shown as box sills on the FIRST FLOOR FRAMING PLAN. Lay box sills on edge and in the proper location. Be sure they line on the outside with the outside of the sill plate (see Figures 16 and 22). Toe-nail (see Figure 18) the box sill into sill plate with 16-penny nails.

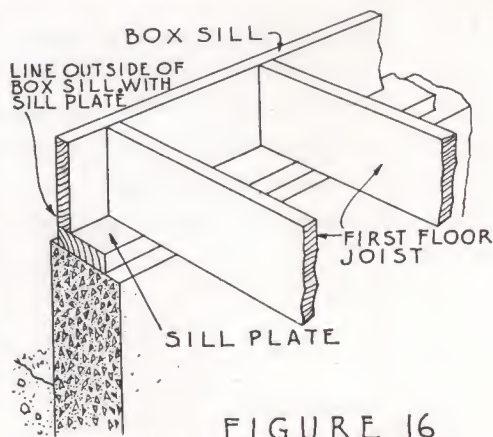


FIGURE 16
FIRST FLOOR JOIST
AND BOX SILL . . .

Selecting Floor Joists

- (b) Select from the pile of lumber those pieces marked FIRST FLOOR JOIST. Lay them out, using the proper ones for each place, as marked on the FIRST FLOOR FRAMING PLAN. Be sure the mark on the piece of lumber is the same as shown on PLAN for each joist.

Spacing Joists and Other Framing Members

- (c) The WALL SECTION and FRAMING PLAN show whether these joists are 2"x8" or 2"x10". Lay the joist with one end resting on top of the sill plate and the other end resting on top of the girder. The ends of the joists fit tight against the box sill (see Figure 16). The outside of the first joist forming the box sill on the end of the building must be flush with the outside of the sill plate, in the same way as the outside of the box sill across the ends of the joists. The measurements for the exact location of each joist are given on the FIRST FLOOR FRAMING PLAN. These measurements are given from the outside face of the end joist to the left side face of all other joists (as shown on the plans)—not from center to center of joists. This same method of spacing is used throughout the plans for all joists, rafters, studs, and other framing members. You will find this method of showing the spacing easy to follow, as you will not have to figure back from center to the side of each piece to work out the spacing. Simply follow the measurements as given in spacing the joists and framing new members, and rapid progress is bound to result.

Stair Openings

- (d) The joists around stair-wells are usually doubled (see PLAN). Be extremely careful to locate these joists and all other headers and trimmers exactly as shown by the measurements on the plans or you will have difficulty in putting in the stairway later.

Blocking Joists

- (e) You will notice that the joists under most of the partitions on the first floor are doubled and some of these are spaced $3\frac{5}{8}$ inches or 5 inches apart. The $3\frac{5}{8}$ -inch spacing allows the furnace stack to go through and the 5-inch spacing, the soil pipe. These joists must be blocked apart as follows:

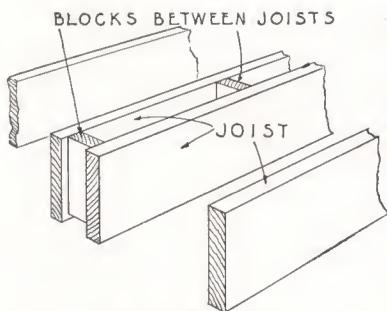


FIGURE 17
METHOD OF BLOCKING JOIST
APART UNDER PARTITIONS

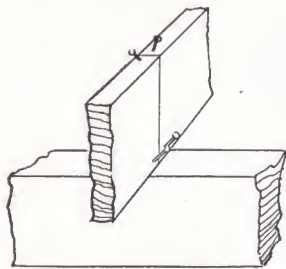


FIGURE 18
ILLUSTRATING "TOE-NAILING"

You will find that some of the joists have a crown to them. That is, they curve slightly, being higher in the middle than on the end when the piece is placed on edge. All joists must be placed with crown up, so that the joist is higher in the center than at the ends. They will level down when the sub-floor is nailed on.

If the chimney has been located exactly as shown on plan and the joists properly spaced, there will be a space of $\frac{1}{2}$ inch between the joist and the chimney. If there is a City Ordinance which calls for more than $\frac{1}{2}$ inch space, cut off the joists around chimney as much as necessary so as to leave a wider space.

22—BRIDGING

1"x3" bridging is furnished for all joists 2"x8" or larger. This bridging is put in diagonally between the joists (see Figure 19). Put in a row of bridging in the center of each span of joists which is over 10 feet. Nail the top

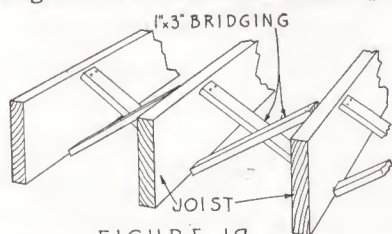


FIGURE 19
METHOD OF PUTTING IN BRIDGING

end into the side of the joist before any flooring is laid on the joist. This will leave the bottom end loose. The bottom end of the bridging should be nailed through into the next joist after the house is framed, but before it is lathed. Use two 8-penny common nails in each end of each piece of bridging.

23—SUB-FLOOR

Sub-floor is furnished for all first floors and also all second floors if a stairs to second floor is shown on plans. The sub-floor is 1"x6" tongued and grooved flooring, and is furnished in sufficient quantities to be laid at right angles over the joists or diagonally if desired.

(f) 3 $\frac{5}{8}$ " Apart

(g) 5" Apart

(h) Nailing Joists

(i) Crown of Joists

(j) Space Around Chimney

(a) Where Furnished

When to Put in Bridging

(a)

Laying
Sub-Floor

Nailing

- (b) Lay the first row of sub-floor starting at the outside of the box sill and laying at right angles or diagonally, as desired, to the joists. The next row of flooring laid should not have the joints, between the ends of the boards, on the same joist as the first row (see Figure 20). Continue laying the sub-floor with alternate joints all the way across the joists until the floor is completely covered. Blind nail (see Figure 21) each piece of sub-floor through into each joist with an 8-penny common nail.

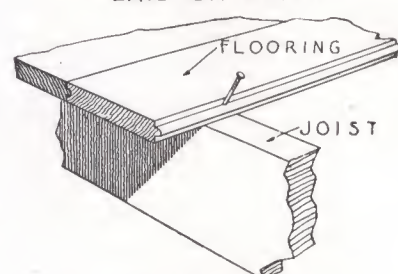
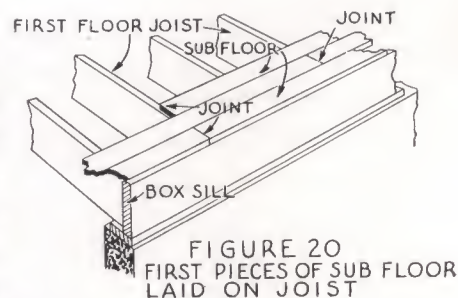


FIGURE 21
ILLUSTRATING "BLIND NAILING"

- (c) It is necessary to saw off part of the last boards laid so that sub-flooring will end even with the sill plate.

24—OUTSIDE WALL BOTTOM PLATES

Size

- (a) All plates are 2"x4" and are marked PLATE.

Selecting
Plates

- (b) After the sub-floor has been laid select the outside wall bottom plates from the pile of lumber. Arrange all of these on the floor in the exact locations, as shown on FIRST FLOOR PLATE PLAN. **Do not nail any of these plates down until they have been properly located and placed in position on the floor.** Select the plates with marks on them to agree with the marks on the PLAN.

Nailing

- (c) After the outside bottom plates have been properly arranged on the floor (as shown on the FIRST FLOOR PLATE PLAN and as described above) nail them down to the sub-floor and through to box sill. Use 16 penny common nails. Be careful that the plates are in a true, straight line and that the outside edges of the plates are flush or even with the outside of the box sill (see Figure 22).

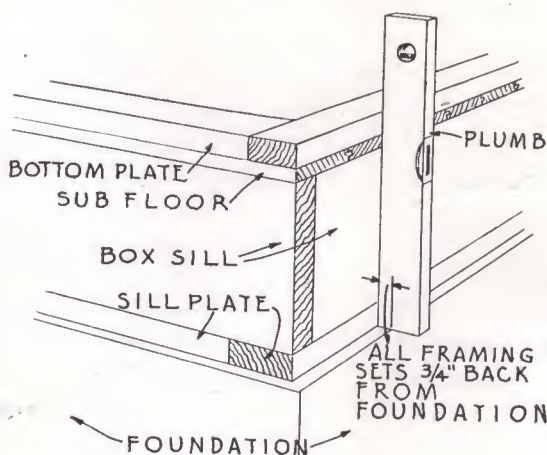


FIGURE 22
OUTSIDE CORNER OF BUILDING,
SHOWING BOTTOM PLATES

25—OUTSIDE WALLS, FIRST METHOD

Erecting
Walls

- (a) There are several ways of erecting the outside stud walls. Three different ways are shown on the following pages. Each method has its advantages and your choice should depend largely on the number of men you have on the job to do the work.

The first method outlined is the quickest method of construction. However the help of at least three or even four men is required, as one entire wall is erected at one time. In the following paragraphs each step is described and by following these instructions, rapid progress can be made in erecting the framing. (b)

To begin, mark the stud locations on the bottom plate that has already been nailed to the box sill. The correct spacing and location of all outside wall studs is shown on the WALL FRAMING ELEVATIONS. The studs are spaced as described in Paragraph 21-C, and it is only necessary (c)

Marking
Plates

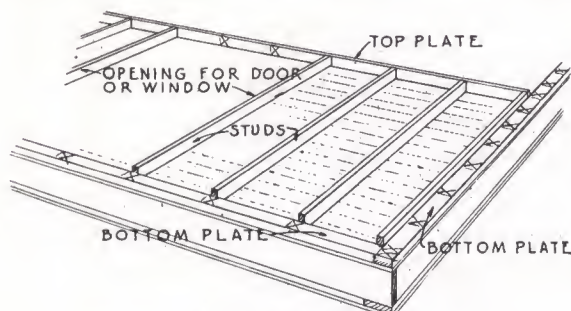


FIGURE 23
STUDS AND TOP PLATE LAID
OUT ON THE FLOOR

Then lay out the top plates on edge parallel to the bottom plate and about 9 feet apart. Select the main studs and butt them against the top plate at the locations indicated by the marks on the plate. Be sure that all studs are spaced as shown on the FRAMING ELEVATION. Leave out the studs where windows and doors are to go. Nail the top plates to the studs by nailing through the top plate into the ends of studs with 16-penny common nails. (See Figure 23.)

Next, locate the headers, cripples and trimmers for the windows and doors in this wall. Some of these members are bundled and tied together but are branded or marked, HEADER, CRIPPLE, or TRIMMER. Break open the bundles and lay each piece near where it is to be used. Do not break open any bundles until ready to use. (d)

Framing
Headers and
Trimmers

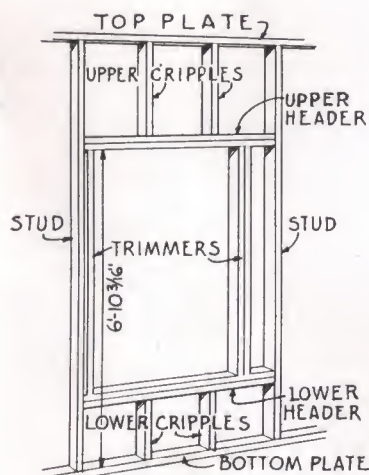


FIGURE 24
FRAMING FOR WINDOW

The window framing is composed of several pieces, the "Headers" which are the horizontal or cross-pieces which frame in at the top and bottom of the window opening. (See Fig. 24.) The "Trimmers" are vertical pieces at the sides of the window opening and run between the headers. The upper "Cripples" are the pieces above the opening, running from the upper header to the top plate. The lower "Cripples" go below the opening from the lower header to the bottom plate. (See Fig. 24.) (e)

Window
Openings

Door Opening

- (f) The door openings are framed out like the window openings except that no lower headers or lower cripples are needed (see Fig. 25).

Cripples

- (g) In framing the window openings, refer to the **Framing Elevations** on plans making sure that the correct lengths are used for the upper and lower Cripples. Place the upper Cripples against the top plate where indicated by the marking on the plate and nail with 16-penny nails in the same manner as the studs were nailed (see Fig. 26).

Headers

- (h) Next put in the upper header by spiking it to the ends of the cripples and through the studs at the sides to the ends of header (see Fig. 27). Door and window Headers in openings under 4 feet are doubled, 2 pieces of 2"x4". After the top piece has been spiked in place the lower piece can be nailed to the one above and through the studs into the end of the piece (see Fig. 28).

Trimmers

- (i) The Trimmers are to be framed in next. Mark the headers for the location of the trimmers. The correct measurements will be found on the **FRAMING ELEVATIONS**. Set the trimmers against the markings on the header and spike in place, driving the nail through the header into end of the trimmer (see Fig. 29). This completes the framing of the door opening.

Lower Headers

- (j) For window openings it will be necessary to nail or frame in the lower headers. The lower headers are also double—2 pieces of 2"x4". The first piece to be spiked in place should be marked for the trimmers in the same way as the upper header and should be nailed in place in the same way as the header above. The second piece of header can then be spiked to first header and to side studs. All members are to be nailed together with 16-penny common nails. Before nailing the headers and trimmers in place refer to the plans to make sure that cripples of the correct length are being used. The cripples are plainly marked to correspond with similar marks on the plans.

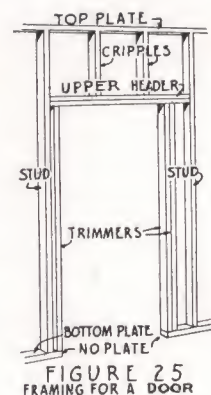


FIGURE 25
FRAMING FOR A DOOR

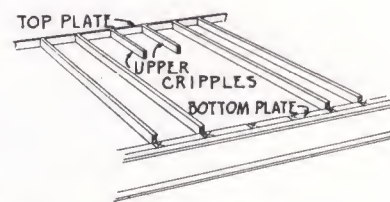


FIGURE 26
UPPER CRIPPLES IN PLACE

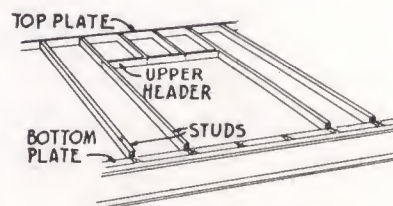


FIGURE 27
FIRST HEADER IN PLACE

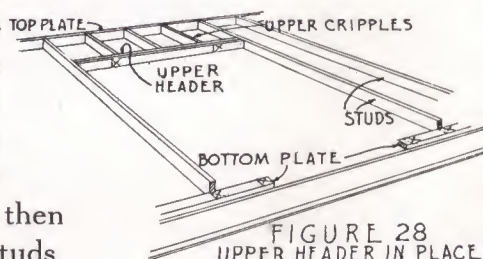


FIGURE 28
UPPER HEADER IN PLACE
MARKED FOR TRIMMERS

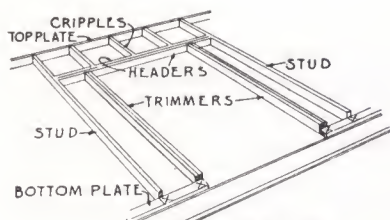


FIGURE 29
TRIMMERS IN PLACE

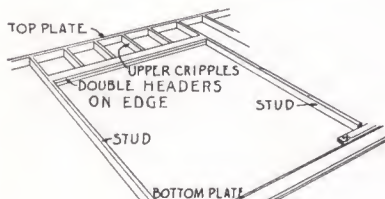


FIGURE 30
DOUBLE HEADERS OVER WIDE OPENING

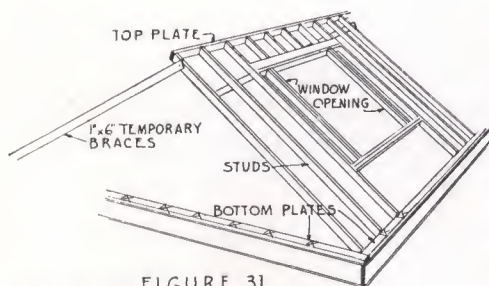


FIGURE 31
RAISING WALL INTO POSITION

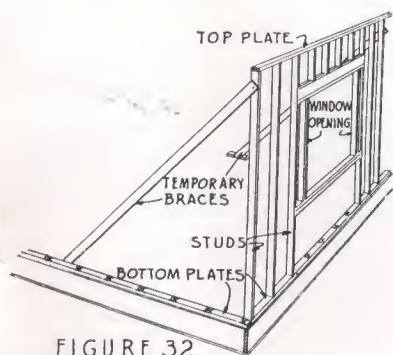


FIGURE 32
OUTSIDE WALL IN POSITION

In all openings 4 feet wide or over, the upper header instead of being two pieces of 2"x4" laid flat, consists of either two pieces of 2"x6" or 2"x8". These pieces are to be laid on edge as shown on **Framing Elevations**. (See Fig. 30.)

The wall is now ready to raise into position.

Fasten some temporary braces of 1"x6" from 10 to 12 feet long to the side of the end studs and two or three through the middle of the wall. Then push the bottom of the wall studs over, so that they rest against the bottom plate. Raise the whole wall into position by pushing up on the braces (see Figure 31). In raising the wall, be careful not to bend or twist it. If you do the nails will loosen and the frame will be weak and flimsy. For this reason the second method of erecting a wall is better (see Paragraph 26-b on next page). Plumb the wall carefully so that it is vertical (straight up and down). Nail the braces into blocks nailed to the floor (see Figure 32).

Toe-nail (see Figure 18) the studs down to the bottom plate. Be sure that the left side of the stud sets against the marked line on plate which was put on when laying off the studs on the plate. This is important, otherwise the studs will not be vertical (straight up and down). Set in the lower cripples in all window openings and toe-nail these to the header and to the bottom plate.

If the wall is 36 feet or more in length it will require four men to raise it.

26—OUTSIDE WALLS, SECOND METHOD

The second method of erecting a wall only requires two men and is exactly the same as the first method described above, except that:

Take only a short section of the wall—that is, the length of one plate—at a time and lay it out and raise it. This is a better method than the first, as there is less danger of loosening nails when raising the sections.

Temporary
Braces

Raising the
Wall

Lower Win-
dow Cripples

One Section
at a Time

27—OUTSIDE WALLS, THIRD METHOD

- (a) The third method requires only two men, and is as follows:

Corner and End Studs

- (b) Erect the corner studs first. Brace them so they are plumb. Next erect the stud which sets over the joint between the end bottom plate and the plate next to it. Plumb and brace this stud (see Figure 33).

Top Plate

- (c) Then put on the top plate, which must be marked first for the location of studs as described in paragraph 25-c. Be sure that the marks on this top plate match those on the bottom plate (see Figure 34). Toe-nail the bottom end of the studs to the bottom plate, setting left side of studs in line with marks on plate. At the top of the studs nail through the top plate into the top ends of the studs. Then put in the other studs in this section of wall, being sure to leave out the studs where door or window openings are to go. You will find it easier if one man works on the floor, toe-nailing the studs to the bottom plate, while the other one works on a step ladder, nailing through the top plate into the top ends of the studs (see Figure 35).

Other Studs

Door Opening Framings

- (d) See Figure 25 for illustrations of door framings. Build the door openings by setting the header on the trimmers and nailing into place. Nail through the header into the top ends of the trimmers and nail through the studs into the ends of the headers. Put on the upper header and nail it into the header and also nail through the studs into this header. Then put in the cripples over the opening. Nail through top plate into the upper ends of the cripples and toe-nail the cripples into the headers below.

- (e) The window openings (see Figure 24) are framed out the same as described for the framing of the doors excepting that the lower headers and cripples are framed first. Select the correct length cripples by referring to the plans. Before framing out the opening mark the locations of the cripples on the top and bottom headers as previously described. Then proceed as follows:

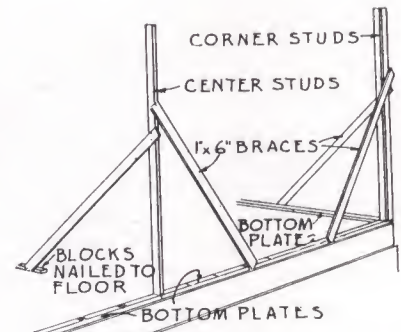


FIGURE 33
ERECTION OF CORNER STUDS

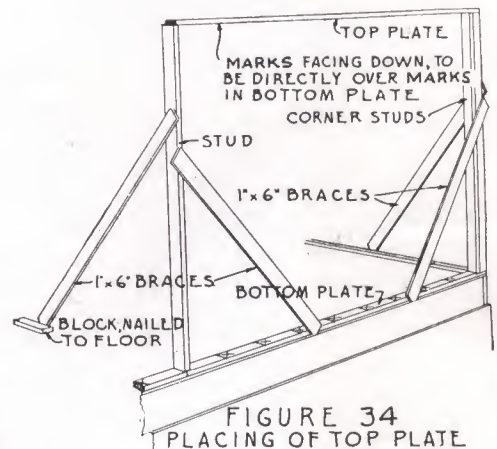


FIGURE 34
PLACING OF TOP PLATE

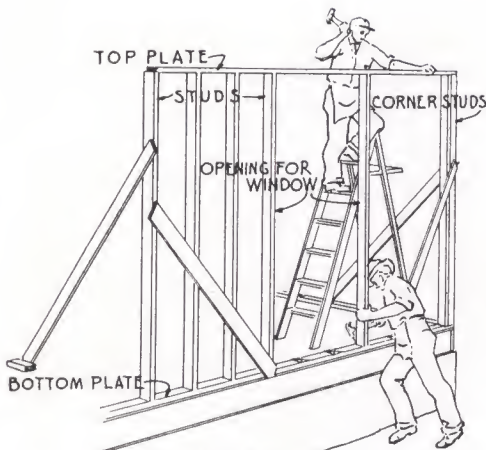


FIGURE 35
PUTTING IN STUDS

Set the lower cripple on the bottom plate and cap with lower header. Toe-nail the cripples to the bottom plate and nail through the top of the header into the top ends of the cripples. Lay another header on top of the header already in place. Nail the two headers together and nail through stud into the ends of the header. Then put in the trimmers, double upper headers and upper cripples in the same way as described in the door openings (Paragraph 27-d).

All of the above studs, plates and openings are to be nailed together with 16-penny common nails.

Window
Opening
Framings

(g) Use 16-Penny
Nails

28—OUTSIDE STUDS WITH RIBBON

(This paragraph applies only to one and one-half story houses, where this construction is shown on the blue prints.)

Some story-and-a-half houses have a ribbon set in the outside studs. The second floor joists rest on this ribbon (see Figure 36). If this is true on the house you are building, be sure to turn the stud so that the notch for the ribbon is on the inside. After the wall is raised and braced in place, set in the ribbon, which is exactly $\frac{3}{4} \times 3\frac{1}{2}$ ", into the notches in the studs. Nail at each stud and cripple with two 8-penny common nails.

(a) One and
One-half
Story Houses

(b)

Ribbon
Inside of
Stud

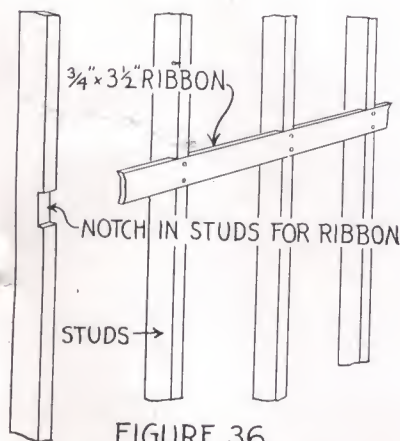


FIGURE 36
RIBBON SET IN STUDS ON WHICH
SECOND FLOOR JOISTS REST

29—INSIDE BEARING PARTITIONS

The inside bearing partitions are those on which one end of the joists above them rest.

These bearing partitions must be built next. Erect them in the same way as you erected the outside walls.

(a) Bearing
Partitions

(b)

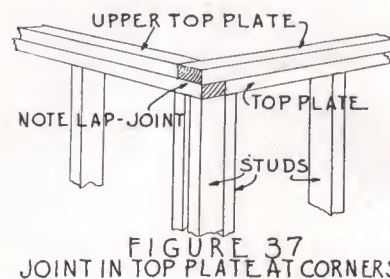
Locating
Plates

First find the correct bottom plates and nail them to the floor. Then lay out the studs and top plate and openings in the same way as described for outside walls. First lay off the studs on both the top and bottom plates. Mark the places where they are to go with pencil. The studs are spaced 16 inches, center to center (from the center of one stud to the center of the next). It

- Partition Studs** is easier to lay them off by measuring from the side of one stud to the same side of the next one, which is the same as "center to center."
- Studs Not On Plates** (d) With but very few exceptions, these studs are marked STUD S8-3-3. By referring to the FIRST FLOOR PLATE PLAN and WALL ELEVATIONS you will find a few "Studs without bottom plates," which are branded S8-5. The bottom ends of these studs set on the sub-floor and not on a plate.
- Laying Out Studs** (e) It is important in laying out the spacing of the studs that you start at the proper end of the wall as indicated on plan. Unless this is done the bottom plates will not work out properly with the door openings. Be careful to build these partitions square with the outside walls, and make them plumb and true to a line.
- Nailing** (f) Nail the various parts of these partitions together in the same manner as the corresponding parts of the outside walls. That is, toe-nail the studs to the bottom plate and nail through top plate into top ends of studs.
- Backing** (g) See Paragraph 60-b as to the proper time and method of applying backing.

30—UPPER TOP PLATES

- On Two-Story Houses** (a) On a two-story house, a double plate is framed around the house at the second floor level. This plate consists of a top and bottom member, and is shown on the plans marked WALL ELEVATION.
- (b) Place the upper top plates (shown on Figure 37) on top of the top plates already in place. Be sure that they are in the positions shown on the WALL ELEVATIONS. You will notice that on a wall where the top plate runs up to the outside of a corner, the upper top plate only runs up to the wall. This allows the upper top plate of the other wall to cross the end of the first wall (see Figure 37). This makes a lapped plate at all outside corners of the building, thus tying the walls together.
- Lap Plates at Corners**
- (c) Next put on the upper top plates of the main bearing walls, and nail all of the upper top plates down to the top plates beneath them with 16-penny common nails.
- Top Plates on Bearing Walls**



31—SECOND FLOOR JOISTS

- (a) (This paragraph applies only to a two-story house.)
- Selecting Joists** (b) See WALL SECTION and SECOND FLOOR FRAMING PLAN as to whether or not these joists are 2"x8". Select the proper joists, with the correct brands or marks on them, for each part of the second floor. These are shown on the SECOND FLOOR FRAMING PLAN. These joists are all branded SECOND FLOOR JOISTS.

The easiest way to set these joists in place is for one man to sit astride the top of the main bearing partition, another on the top of an outside wall and a third man on the first floor to hand up the joists to the first two men. (c)

Raising Joists

First measure off and mark on the upper top plate just where the second floor joists are to go. Follow the measurements shown on the SECOND FLOOR FRAMING PLAN. Check the walls to see that they are plumb and true to a line before nailing the joists down. Take the same care to place the joists, or headers, around the stair-well opening as you did in locating the first floor joists. The second floor outside wall studs are toe-nailed to the upper top plate, directly above the first floor studs. Notice very particularly that the ends of the joists resting on the outside walls must set tight against the second floor studs on the upper top plates. (See Figure 38). The studs and joists will be nailed together to make a very solid construction. (d)

Locating Joists

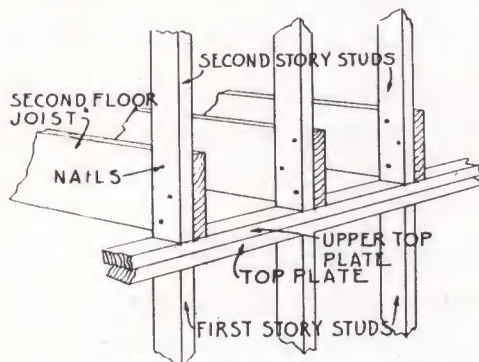


FIGURE 38
SECOND STORY STUDS AND JOIST

Set Against Stud

It will be better if the headers around stair-well opening are not nailed into place until the second floor studs are in place. These joists then can be drawn up tight to the studs when nailing. Toe-nail the joists to the upper top plates, as you go along, with 8-penny nails. Nail the outside end of joists to the studs next to them with 16-penny nails (see Figure 38). (e)

Nailing Joists

Lay all joists with the crown up, as described in Paragraph 21-i. (f)

32—SECOND FLOOR JOISTS

(This paragraph applies only to one-and-one-half-story houses.) (a)

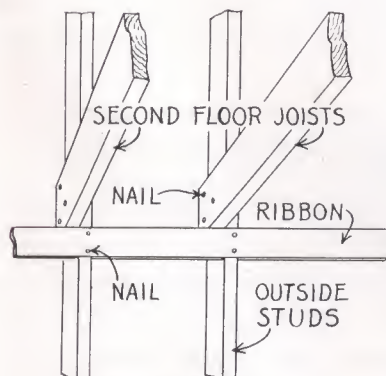


FIGURE 39
SECOND FLOOR JOIST
SITTING ON RIBBON

If the outer ends of the second floor joists run into the outside walls which run above the second floor, lay this end on the ribbon (see Figure 39). Locate the joists as described in Paragraph 31. The outer ends of the joists are placed next to the studs and are nailed to the studs with 16-penny nails. (b)

Joist On Ribbon

If the outer ends of the second floor joists run into the gable end wall, lay this end on the upper top plate. Proceed, in this case, in exactly the same way as described in Paragraph 31. (c)

Joists On Plate

33—SECOND STORY SUB-FLOOR

Like First
Story Sub-Floor

- (a) (This paragraph applies only to two-story and one and one-half-story houses.)
- (b) Lay the second story sub-floor in exactly the same manner as described for the first story sub-floor (see Paragraph 23). Do not run the sub-floor beyond the inside line where the second story studs are to be set. Otherwise it will be necessary to cut into the sub-floor when setting the exterior second story studs.

34—SECOND STORY OUTSIDE WALLS

Same as
First Story

- (a) (This paragraph applies only to two-story houses.)
- (b) The second story outside wall studs are marked STUD S7-10-3.
- (c) The second story outside walls can be erected in exactly the same manner as any of the methods described for the first story. Toe-nail the studs down into the upper top plates of the first story. Where the ends of second floor joists are beside the studs, nail them together with three 16-penny common nails (see Figure 38). Build in the window openings in these walls as you did in the first story walls.

Nailing

- (d) As you proceed with the erection of the walls, brace the sections carefully, making sure that all framing members are level and plumb. Mark all plates and headers for the location of the studs and cripple studs. Use plenty of 16-penny and 8-penny nails. The strength of the frame is dependent largely on how well you have nailed it together.

35—INSIDE SECOND STORY BEARING PARTITIONS

Bearing
Partitions

- (a) (This paragraph applies only to two-story and one-and-one-half-story houses.)
- (b) The main partitions on which the attic or ceiling joists rest are the bearing partitions. Build these on top of the second story sub-floor in exactly the same way as you built the interior first story bearing partitions. All second story partitions are shown on the blue prints on the SECOND FLOOR INTERIOR PARTITION ELEVATIONS.

36—CEILING AND ATTIC JOISTS

Placing
Joists

- (a) The ceiling or attic joists, as shown on CEILING FRAMING PLAN or ATTIC FLOOR FRAMING PLAN, as the case may be, are now to be put on. The same general method as described before the laying joists is to be followed. One end of these joists rests on the upper top plates of the outside walls and the other end on the upper top plate of the bearing partitions. The outside end of the joist is to be flush or even with the outside of the outside plates and studs. When necessary, the outside end of the joist is furnished cut on an angle, so that it will not project beyond the line of the roof rafters.

In a house with a gable or gambrel roof, the joist which is parallel to the gable end wall is set back from the outside of the building so that the outside of the joist is even with the inside of the top plates of the wall below.

In a hip-roofed house the end joists which run in the same direction as the outside wall are set back to a distance of 16 inches from the outside of the plate to the center of the joist. See FRAMING PLAN.

See Figures 48, 43, and 51 for illustrations of hip, gable and gambrel roofs.

Toe-nail the ends of the joists into the upper top plates of both the outside wall and the interior partition with 8-penny common nails. See that all walls and bearing partitions are plumb and true to a line before nailing joists.

- (b) In a Gable or Gambrel-Roofed House
- (c) In a Hip-Roofed House

- (d)
- (e) Nailing

37—OUTSIDE WALL COVERING

The exterior of all outside walls from the bottom of sill-plate to the top of top plate is to be covered with 1"x8" shiplap. The shiplap sheathing is to be put on horizontally around the building,

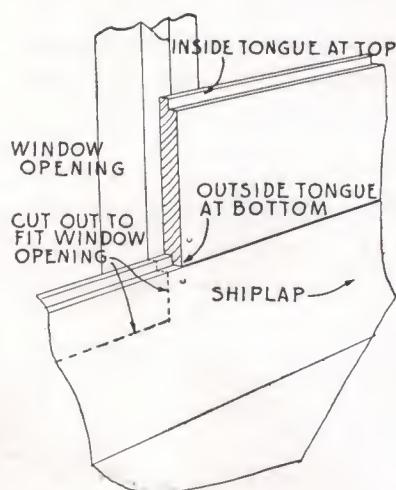


FIGURE 40
METHOD OF APPLYING SHIPLAP

not diagonally. Each board is placed so that the outside tongue is on the bottom. Break joints over every stud as described under SUB-FLOORING, Paragraph 23, Figure 20.

You will discover, in some cases, that the shiplap will run across and inside of the top and bottom headers of the window openings, thus covering part of the opening. Where it does this take a hand axe or hatchet and chop it out, as shown in Figure 40. Then, later on, the window frame will slide in easily.

Nail the shiplap to each stud with two 8-penny common nails.

- (a) Applying Shiplap

- (b) Shiplap Across Openings

- (c) Nailing

38—ATTIC FLOOR

(This paragraph applies only when attic floor is shown on blue prints.)

If an attic floor is shown on the WALL SECTION and ATTIC FLOOR FRAMING PLAN, lay it in exactly the same way as the sub-floor on the first story floor.

A "rafter plate" is a plate which sets on top of the attic floor and on which the rafters set. If a rafter plate is shown, the attic floor runs clear to the outside of the outside studs (see Figure 41).

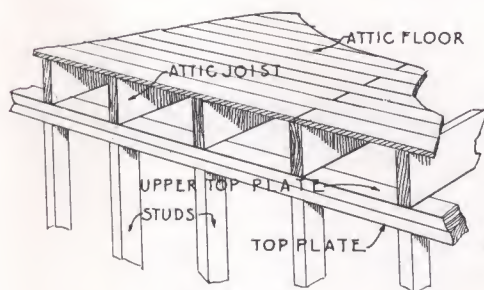


FIGURE 41
ATTIC FLOOR RUNNING TO OUTSIDE OF WALL

- (a)
- (b) Same as Sub-Floor
- (c) If With Rafter Plate

**If Without
Rafter Plate**

- (d) If there is no rafter plate and the rafters rest on the upper top plate of the second story, the attic floor runs only out to the under side of the rafters. In the case of a gable-roofed house, the flooring runs to the inside of the gable studs (see Figure 42).
- (e) Blind-nail the flooring to each joist with 8-penny common nails (see Figure 21).

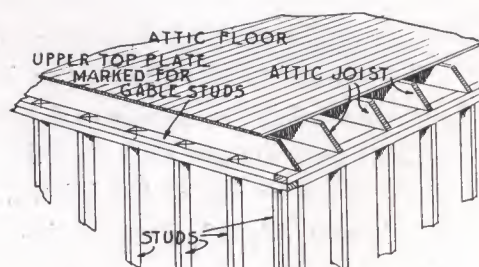


FIGURE 42
ATTIC FLOOR RUNNING
UP TO WALL

39—RAFTER PLATE

**Lay Out
Plates**

- (a) (This paragraph applies only when rafter plate is shown on blue prints.)
- (b) When rafter plates are shown on the drawings, as described in Paragraph 38-c, lay them out on the attic floor. Place the pieces in the proper places, as marked on the blue prints. Have the outside of the plate even with the outside of the plates and studs below.

Nailing

- (c) Nail through the plate into the joist below with 16-penny nails.

40—MAIN ROOF RAFTERS FOR A GABLE ROOF

End Rafters

- (a) (This paragraph applies to houses with a gable roof—see Figure 43).
- (b) Take the end piece of the ridge board marked RIDGE and lay it on edge. Then lay out, at right angles to it, one end rafter and another rafter near the other end of the ridge (see Figure 44). Space the rafters the correct distance apart, as shown on ROOF FRAMING PLAN. Nail the ridge to these rafters with two 8-penny common nails at each rafter. Raise this small section of the roof into position. Brace temporarily with any 1-inch lumber (see Figure 45).



FIGURE 43
A GABLE ROOF

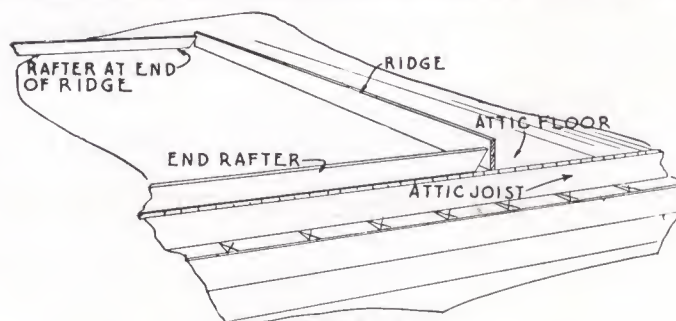


FIGURE 44
LAYING OUT FIRST RAFTERS

**Notch In
Rafter**

- (c) The notch in the rafter, where it sets over the wall plate, sets on the plate and over the **outside of the sheathing** (see Figure 46). Toe-nail the rafter into the plate.

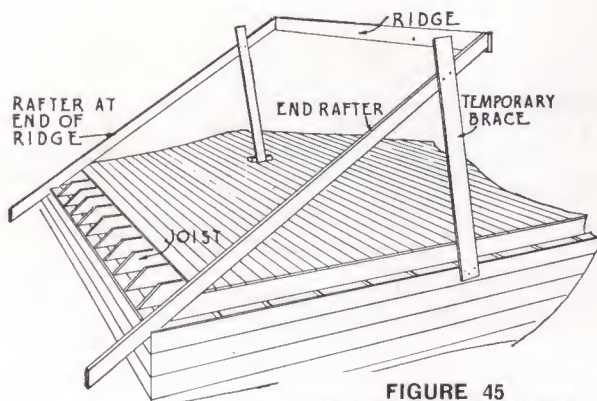


FIGURE 45
FIRST RAFTERS IN POSITION

Next raise into position (d) the two rafters on the other side of the roof corresponding to, and making pairs with, the first two (see Figure 47). Nail these through into the ridge and to the plate.

First Pairs of Rafters

Fill in the rafters between (e) these two pair, spacing them the exact distances as marked on ROOF FRAM-

Intermediate Rafters

ING PLAN. In spacing the second rafter from the end of the building, notice that the measurement given on the plan is from the **outside** of the end rafter

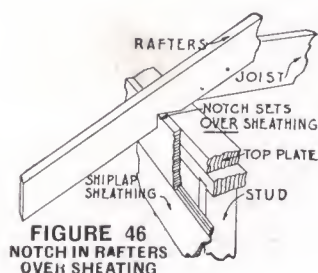


FIGURE 46
NOTCH IN RAFTERS OVER SHEATHING

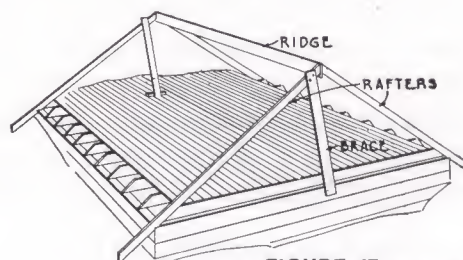


FIGURE 47
TWO PAIR OF RAFTERS IN PLACE

(or stud line) to the left side of the second rafter. If the ridge is more than one board in length, the joints of the ridge will be in the center of the rafters.

Locate the rafters with extra care around dormers (see Paragraph 63). (f) Double them where shown on the plan, in order that the dormer will fit the roof correctly. Unless all of the rafters are placed so as to agree with the plan, the roof will not fit together properly.

Around Dormers

Use 16-penny common nails for nailing the rafters together.

(g)

Nailing

41—MAIN ROOF RAFTERS FOR A HIP ROOF



FIGURE 48
A HIP ROOF

(This paragraph applies to houses with a hip (a) roof—see Figure 48.)

First set up two pair of common rafters, as described in Paragraphs 40-b, 40-c and 40-d. (b) **Do not put up the hip rafters first.** Hip rafters are the diagonal ones at the corner. Next set up the two main rafters, which are at right angles to the first two

Common Rafters First

Hip Rafters

pair and which run in the same direction as the ridge board (see Figure 49). The hip or diagonal rafters, which run to the corners of the building, are then put up. The upper end runs into the corner or angle formed between the common rafters first put up (see Figure 50). The jack rafters, which are the shorter rafters running from the hip rafters to the plate, can now be put in.

Jack Rafters

In framing the roof, be very careful that the top edges of all rafters and the ridge are flush or even. If there is a difference in the width of the rafters where they join, let this show on the bottom of the rafter or ridge, not on the top.

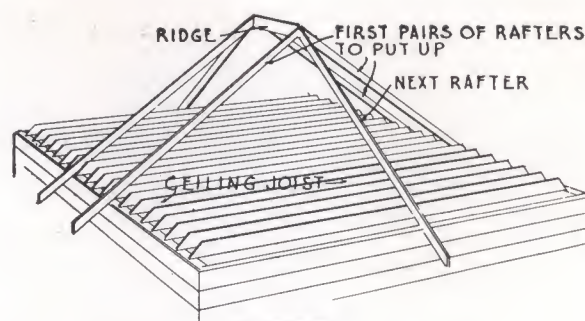


FIGURE 49
FIRST RAFTERS TO PUT IN PLACE
ON HIP ROOF

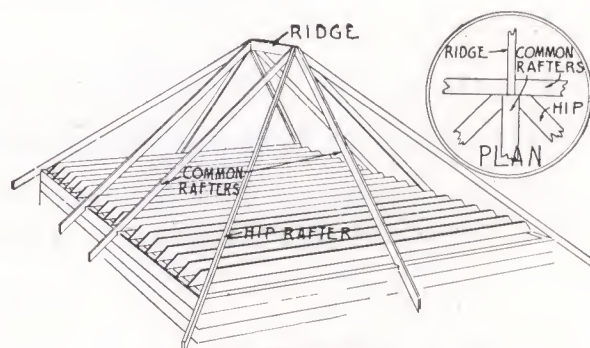


FIGURE 50
SHOWING HIP RAFTERS IN PLACE

Around Dormers

- (c) Frame out for dormers and space rafters exactly as shown on plan and as described in Paragraphs 40-e and 40-f.
- (d) Nail all of the rafters together and nail the rafters to the plates and ridge with two 16-penny common nails at each point.

42—MAIN ROOF RAFTERS FOR GAMBREL ROOF

Erected Similar to Gable Roof

- (a) (This paragraph applies to houses with a gambrel roof—see Figure 51.)
- (b) The upper roof—that is, the flatter portion—is built exactly the same as a gable roof (see Paragraph 40). The lower part should be built in at the same time. The bottom ends of the rafters in the lower part rest on the first story upper top plate. The upper ends of these rafters meet the lower ends of the rafters of the upper part of the roof. See the ROOF FRAMING PLAN and WALL SECTION. As there is considerable variation in the different parts of the roof, it is advisable to make a careful study of the ROOF FRAMING PLAN and the WALL SECTIONS. Then proceed to build the roof in accordance with the blue prints, and in much the same manner as a gable roof, described in Paragraph 40.

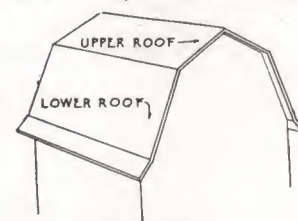


FIGURE 51
A GAMBREL ROOF

Nailing

- (c) Nail the rafters together and to the plates with two 16-penny nails at each joint.

43—RAFTER TIES

Some houses with extra long rafters have rafter ties or collar beams. These (a)

How Placed

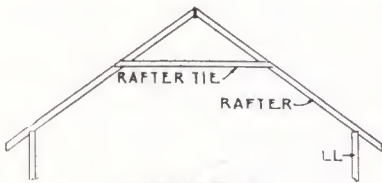


FIGURE 52
RAFTER TIES OR COLLAR BEAMS

are horizontal or level pieces running across from one rafter to the corresponding rafter on the opposite side of the roof, and act as braces and ties to the rafter (see Figure 52). In the case of a one-and-one-half-story house these ties act also as ceiling joist for the second story. Be sure to place these ties the proper height above the floor, as shown on SECTION. Nail them

to each rafter with two 16 or 8-penny common nails. The ties are shown on the ROOF FRAMING PLAN, or on SECOND FLOOR CEILING FRAMING PLAN, when they act as ceiling joists.

44—HORIZONTAL CLOSED CORNICE

This paragraph applies only to houses having a closed cornice with look- (a)
outs. That is, when the projection of the roof beyond the outside of the house returns horizontally to the house. See Figure 53.

Lookouts

Put in the lookouts after the rafters are in place. These lookout pieces (b)

Must be
Straight and
Level

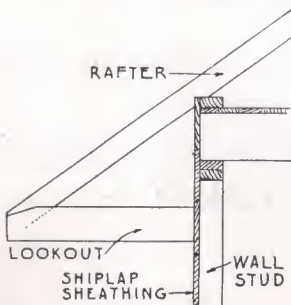


FIGURE 53
CLOSED CORNICE
LOOKOUT

are 2"x4" or 1"x6", depending on the type of roof, and are branded or marked "LOOKOUTS." The lookouts must be put up so that they are perfectly level, at right angles to the sheathing, and so that the outer ends of the lookouts and of the rafters can be lined up into a straight line down the edge of the roof.

Nail the ends of the rafters and lookouts to- (c)
gether. Toe-nail the back end of the lookout into

Nailing

the sheathing with 8-penny common nails.

45—FACIA

The fascia is a piece of $\frac{3}{4}$ inch thick finish lumber which caps the ends (a)
of rafters and lookouts (see Figures 54, 55 and 56).

Put on the fascia and nail it to the ends of the rafters with 8-penny cas- (b)
ing nails. Be careful to line the bottom edge of the fascia perfectly level. Place it at the proper height on the end of the rafter, as shown on the WALL SECTION.

Face Must
Be Level

On Closed Cornice

- (c) On a closed cornice, be sure that the fascia projects about $\frac{7}{8}$ of an inch below the rafter or lookout, so as to cover the end of the ceiling under the lookout. (See Figure 54.) If no lookouts are shown on WALL SECTION,

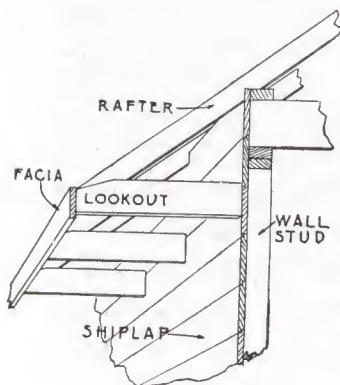


FIGURE 54
FACIA ON CLOSED CORNICE

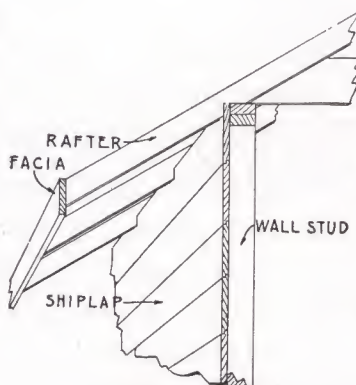


FIGURE 55
FACIA ON CLOSED CORNICE
WITH LOOKOUTS

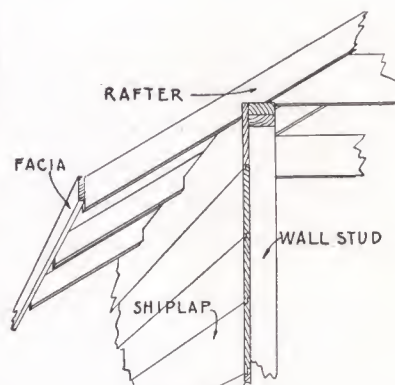


FIGURE 56
FACIA ON OPEN CORNICE

When Ceiled On Rake On Open Cornice

the ceiling is placed on the "rake" or slant of the under side of the rafter (see Figure 55). If the house has an "open cornice"—that is, when the rafters are exposed to view—put on fascia as shown in Figure 56.

46—ROOF SHEATHING

Spacing and Laying Roof Sheathing

- (a) On all roofs (except the open cornice type, see Figure 56 and Paragraph 47) start the roof sheathing at the lower end of the rafter and lay up the roof. At the top of the WALL SECTION is a note giving the spacing of the roof sheathing, for 4-inch sheathing for wooden shingles, 6-inch sheathing is furnished and is to be laid tight for asphalt shingles or roofing.

47—ROOF SHEATHING ON OPEN CORNICES

Beaded Sheathing On Open Cornices

- (a) On the open cornice type of roof (see Figure 56) the roof sheathing over the cornice is $3\frac{1}{4}$ inches wide, dressed, matched and beaded. It must be laid tight together. The bead, if it is only on one side, is to be laid down with the rougher side of the board on top. Lay the beaded roof sheathing over the open cornice as far up the roof and as far back in the gable ends as is shown by the measurements on the WALL SECTIONS. After laying all of the tight roof sheathing, start laying the spaced roof sheathing as described in Paragraph 46.

Nailing

- (b) All roof sheathing should be nailed at each rafter with two 8-penny common nails.

48—SCAFFOLDING

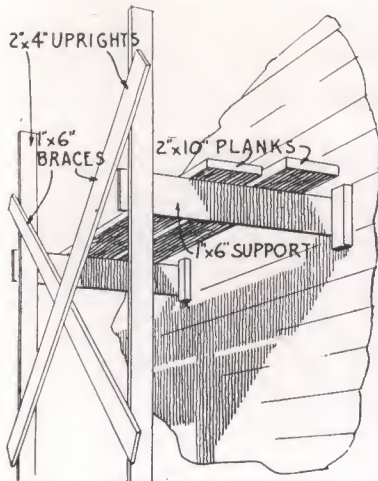


FIGURE 57
SCAFFOLDING

Scaffolding is furnished for one side and one end of the building, and is marked SCAFFOLDING.

It is advisable to do as much of the work as possible on each side at a time so as not to move the scaffolding around unnecessarily. The uprights are 2"x4", spaced about 6 feet apart. Nail a block on the sheathing on a line with the upright and nail a 1"x6" board against the side of the block on one end and to the side of the upright on the other. On this lay the 2"x10" planks (see Figure 57). Build the scaffolding to within 4 feet of the roof.

(a) **Furnished for
Side and End**

(b) **Erecting
Scaffold**

49—CROWN MOULDING

The crown moulding covers the space between the top of the facia and the under side of the shingles. The design number of this moulding is shown on the WALL SECTION, and the same number will be found marked on the package of moldings. This same thing is true of all mouldings—in order to find the proper moulding for any place shown on the blue prints, simply look for the same number on the moulding packages.

(a) **Selecting
Proper
Moulding**

Most houses with box gutters do not have a crown moulding on the horizontal part of the cornice where the gutter runs. In this case the facia is wide enough to come up tight under the shingles. All houses, however, have a crown moulding in the gable ends.

(b) **With Box
Gutters**

In Gable Ends

Nail the crown moulding to the facia with 6-penny or 8-penny casing nails about 1 foot apart.

(c)

50—BOX GUTTERS

At this time, just before starting to shingle the house, it is advisable to put on any box gutters. The hangers should be placed on top of the roof sheathing and under the shingles, so the shingles can hang over the gutter.

(a)

**When to
Hang Gutters**

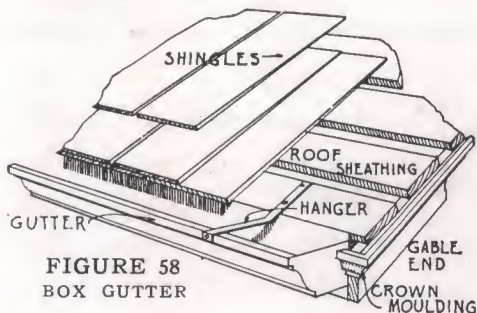


FIGURE 58
BOX GUTTER

some houses having a box gutter the crown moulding runs down the gable end and returns around the corner and butts against the square end of the box gutter (see Figure 58). In this case it is necessary to put up the gutter and crown moulding at the same time, so as to make a tight joint between them.

(b)

**Do Not Rest
Ladder on
Gutters**

If the gutter is put on at this time, special care must be taken not to rest ladders against it. If you do it will become dented and get out of shape.

- (c) See Paragraphs 56 and 57 for the method of hanging the gutters.

51—TIN FLASHING

Valleys

- (a) Before putting on any wooden or asphalt shingles, all parts of the roof are to be properly flashed with tin. In any valleys formed between two roofs lay a continuous strip of tin 20 inches wide, half to be laid on each roof (see Figure 59). Nail this down along the edge with 3-penny galvanized shingle nails. In shingling into this valley keep the edge of the shingle about 4 inches away from the center of the valley (see Figure 60). It is necessary to cut the shingles to fit this line.

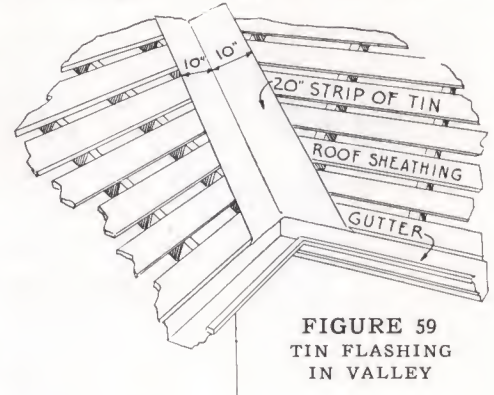


FIGURE 59
TIN FLASHING
IN VALLEY

Flashing Chimneys, etc.

- (b) When the roof joins the chimney, or any other vertical wall or surface set in 5"x7" flashing tins in each course of shingles as they are laid up, and turn up against chimney or vertical surface, as described in Paragraph 16-i. (See Figure 10.) Be sure that flashing runs at least 3 inches under the shingles.

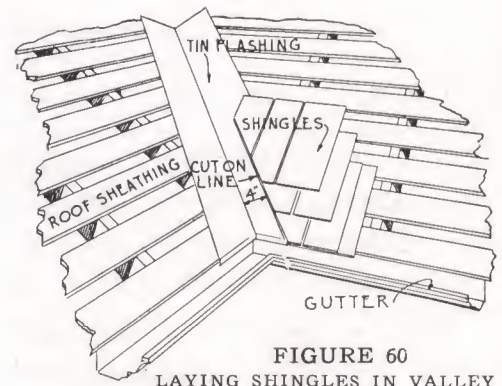


FIGURE 60
LAYING SHINGLES IN VALLEY

52—WOODEN ROOF SHINGLES

- (a) (This paragraph applies only to wooden roof shingles.)
- (b) Lay the first course or row of shingles as a double course—that is, of two thicknesses. Allow the first course to project about 1 inch over the crown moulding, or fascia, where there is no crown moulding. Be sure that this first row of shingles is perfectly straight, then put on the second course and continue on up the roof. Space all wooden roof shingles 5 inches to the weather.

Double First Course

Spacing

Laying

- (c) In order to get the spacing of the shingles correct and in a true line, lay off the 5-inch spacing carefully at two points and snap a chalk line between them. It will be found convenient to lay out two rows at a time rather than to work only one row clear across the roof (see Figure 61). Any shingles which are over 8 inches in width should be split into two shingles. Be sure to lay the shingles $\frac{1}{4}$ of an inch apart. Also lay them so that each shingle covers the joint between the shingles below by at least two inches. Nail each single 6 inches from the bottom edge with two 3-penny shingle nails.

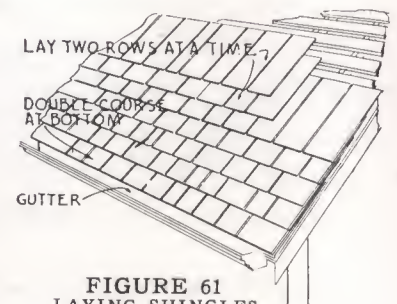


FIGURE 61
LAYING SHINGLES

Cover the ridge with the galvanized iron ridge roll and nail it down tight with 3-penny shingle nails about 4 inches apart. If the house has a hip roof, cover the hips with the continuous hip shingle furnished for this purpose. Nail down tight to the shingles in the same manner as the ridge roll.

(d) Ridge Roll
Hip Shingles

If the house has an open cornice, where the rafters are exposed to view from below, be sure to nail the shingles over this part of the roof with the nails slanting, so they do not project through the ceiling below.

(e) On Open
Cornices

53—ASPHALT ROOF SHINGLES

(This paragraph applies only to asphalt shingles.) (a)

An asphalt shingle roof is an ideal roof if laid properly. It will be if you follow these instructions carefully; if not, you will have trouble. (b)

First lay a single row of wooden shingles around the entire edge of the roof, including the edges of all gable ends (see Figure 62). The row at the bottom of the roof to be laid projecting over the cornice in the same manner as described above for a wooden shingle roof. The outside course in gable ends to be laid with the thick end or butt of the shingle projecting out over the crown moulding—that is, at right angles to all other shingles on the roof. (c)

Wooden
Shingle
Course

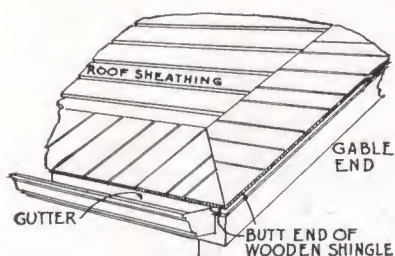


FIGURE 62
FIRST COURSE OF
ASPHALT SHINGLES

First lay a single row of wooden shingles around the entire edge of the roof, including the edges of all gable ends (see Figure 62). The row at the bottom of the roof to be laid projecting over the cornice in the same manner as described above for a wooden shingle roof. The outside course in gable ends to be laid with the thick end or butt of the shingle projecting out over the crown moulding—that is, at right angles to all other shingles on the roof.

The simplest contrivance for getting a foothold on the roof and not damaging the shingles or leaving holes in them is this: Take a piece of 2"x4" about 18 inches long. Onto the edge of this nail a strip of tin 2 inches wide by about 2 feet long (see Figure 63). Turn it right side up and nail the tin to the roof where you wish a foothold. Place several of these under a long 2"x4" (see Figure 64). Move the long 2"x4" up as you work along. It will require a row every twelve courses or so, depending on how long a reach the carpenter has. Leave these on one side of the roof until it is finished, then go over the roof and snip the pieces of tin at the bottom of each row of shingles.

(d) Foothold
On Roof

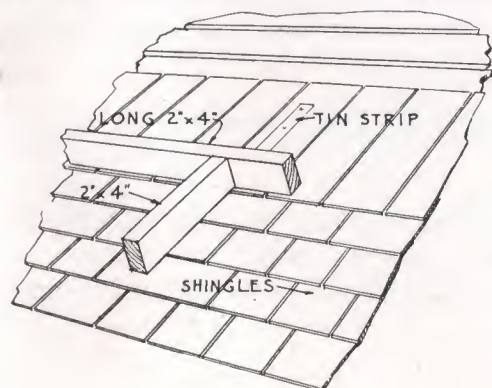
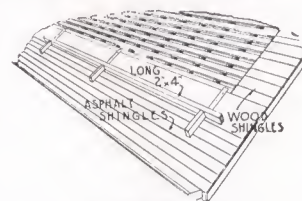


FIGURE 63
LAYING ASPHALT SHINGLES

Be sure that the roof sheathing is perfectly dry before laying asphalt shingles, or they may buckle up. (e)

**Laying
Strip Asphalt
Shingles**

- (f) After the course of wood shingles has been laid around the edge of the roof, start laying the asphalt 4 in 1 shingles. Lay the first course of shingles, reversed (with butts up), flush with wood shingle course. Space each shingle $\frac{1}{16}$ " apart. Lay another course of shingles directly over the starting course, with butts down and also flush with the edge of the wood shingle course.



**Spacing
Nailings**

- (g) Continue laying shingles up the roof. The succeeding courses are to be laid with the lower edge flush with the top of the cut out of the previous course. The cut outs are exactly 4" inches deep and the shingles will therefore be exposed 4" to the weather. Do not expose more than 4 inches. Each shingle must be nailed with 1" large headed galvanized roofing nails, 5 nails to each shingle. The nails should be driven 5" from the bottom edge of the shingle, directly above each cut out and also one nail at each end 1" from the edge. Drive all nails straight; if driven crooked the nails will cut the shingle or push it sideways. After the roof is finished, go over it to find any small nail holes. All of these must be filled up completely with asphalt cement or the holes will leak.

FIGURE 64
LAYING ASPHALT SHINGLES

Filling Holes

**Ridge Roll
Hip Shingles**

- (h) Always be sure to put on the ridge roll and hip shingles furnished, and see that they are nailed down tight. See Paragraph 52-d for method of applying.

54—ASPHALT ROLL ROOFING

Where Used

- (a) (This paragraph applies only to asphalt roofing.)
- (b) As some portions of the roof are too flat to put wooden or asphalt shingles on, it is necessary to use roll roofing for these parts of the roof. If roll roofing is shown on the drawings for any part of the roof, it must be used or the roof will leak.

**In Cold
Weather**

- (c) Before applying roll roofing in cold weather, place it in a warm room for a while just before using. Unroll the roofing on the roof and allow it to lay flat a short time before applying.
- (d) Roll roofing should be laid parallel—that is, in the same direction with the roof sheathing.

**Laying
Roofing**

- (e) Except as described above, lay the roofing in exact accordance with the complete directions inclosed in each roll of roofing, being sure to lap each row at least 2 inches. Cement the lap carefully before applying next row and put nails not more than 2 inches apart.

55—CLOSED CORNICE CEILING

- (a) On houses with a closed cornice, the cornice is sealed on the bottom of the rafters (see Figures 55 and 65), or on the bottom of the lookouts (see Figures 54 and 66). Put on this ceiling as soon as the roof shingles are laid. The ceiling is $\frac{5}{8}$ "x4" dressed, matched and beaded.

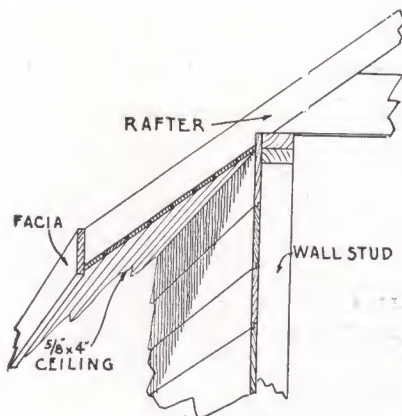


FIGURE 65
CEILING UNDER RAFTER ENDS

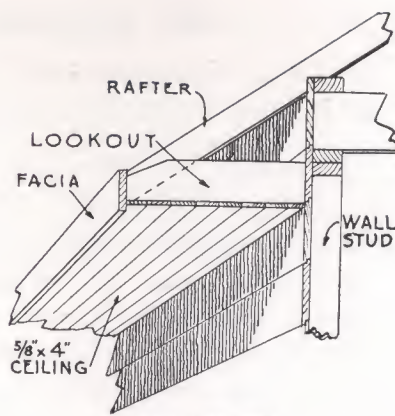


FIGURE 66
CEILING UNDER LOOKOUTS

Nail it at right angles to and up into the lookouts or rafters, as the case may be. It is furnished in random lengths (not cut to fit). Use 6-penny casing nails and blind-nail it to each lookout or rafter with one nail. Be sure that the bead is on the bottom.

(b)

Nailing
Ceiling

56—BOX GUTTERS

All gutters are either box gutters (see Figure 67) or round hanging gutters (see Figure 68).

(a)

If a box gutter (see Figure 67) is shown on the WALL SECTION, hang it to the cornice, resting it tight against the fascia. The hangers for this gutter should be placed about 24 inches apart and across the top of the gutter, and not more than 8 inches from the end. The hangers are to be bent to shape on the job and are to be nailed to the roof boards preferably before the roofing is applied. If the roofing is applied before the gutters are hung in place the hangers should first be nailed to the sheathing and then later adjusted to

(b)

Hanging

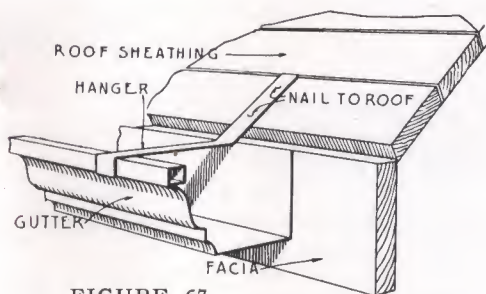


FIGURE 67
BOX GUTTER

the gutter. Bend the hanger so that it will lay up flat on the roof, and nail through the hanger into the roof sheathing, as shown in Figure 67.

The joints between the various lengths of gutters and between gutters and end caps are to be soldered tight together to make a water-proof joint.

(c)

Soldered
Joints

Slope the gutters slightly toward the down spouts. Solder an outlet piece in the gutter where a down spout is to be located. The proper right and left end caps and mitres for inside and outside corners are furnished, so be careful to put each of these in the proper place to complete the gutters, as shown on the ELEVATIONS. Box gutters should be put on before the roof shingles, as described in Paragraph 50.

(d)

Ends

57—ROUND HANGING GUTTERS

Hanging

- (a) If a round hanging gutter (see Figure 68) is shown on the WALL SECTION, hang it after the shingles are on and in the following manner:
- (b) The hanger is a wire one, which sets around the outside of the gutter. The wire in the hanger which goes around the bottom of the gutter is slipped through the loop in the hanger and bent over. The arm of the hanger is then bent so as to lay flat on the roof. Then nail the hanger to the roof (see Figure 68). The joints between the gutters are slip joints—that is, one slips tight into the other and no solder is needed.

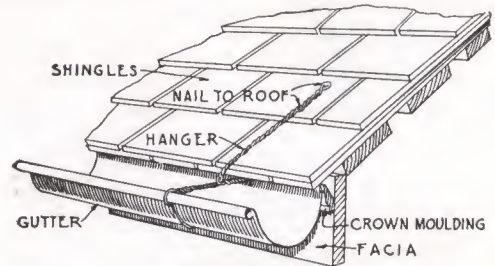


FIGURE 68
ROUND HANGING GUTTER

Slope Gutters

- (c) Slope the gutters slightly toward the down spout. Place an outlet piece in the gutter where a down spout is to be located.

58—DOWN SPOUTS

Hooks

- (a) Set up the down spouts as located and shown on the elevations. Slip the top elbow up around the outlet in the gutter. Use the elbows as necessary to bring the down spout back to the building. Use the shoe (down spout outlet) at the bottom to throw the water away from the building. Fasten the down spouts to the building with the hooks provided. Space hooks about 8 feet apart. These are simply hooked around the down spout and driven into the wall. Bottom hook should be soldered to the down spouts about 2 feet from the bottom end.
- (b) Do not put on the down spouts until after the outside of the house is completely finished, ready for the painting.

59—OTHER INSIDE PARTITIONS NOT BEARING PARTITIONS

Building the Partitions

- (a) After the house is enclosed—that is, the roof covered and the shiplap put on the outside walls, the other partitions may be erected.
- (b) Locate and lay out the bottom plates on the floor, following the PLATE PLAN carefully. **Place all of the plates on the floor in their proper positions before nailing any of them to the floor.** Notice that the measurements given on the PLATE PLANS are between plates and not from center of plate to center of plate. Lay out each partition on the floor, including studs, door openings and top plates in the same way as interior bearing partitions were laid out. Nail together and raise into position. The upper top plates on these partitions should be left off until the partition has been raised into place. Also leave off the end stud which goes against an outside wall.

The end stud going against the outside wall should first have the backing nailed into it (see Paragraph 60-b). Then it can be put into place and nailed. Nail backing onto the upper top plate (see Paragraph 60-c) and set this upper top plate in on top of the top plate of the partitions and nail through into top plate and joist above, so as to make the wall perfectly solid. Use 8-penny common nails. Set all partitions square, plumb and true to a line.

(c) Backing

60—BACKING

Where one partition meets another, it is necessary to put backing on the back of the end stud where the partitions meet. Backing is also necessary over the top of partitions which set between joists. This backing must be put in so as to form a solid corner, to which the lath can be nailed. Backing consists of 1"x3" and 1"x6" strips and is branded or marked BACKING.

(a) Where Used

In erecting the main bearing partitions, the backing can be nailed onto the outside stud from the outside, if it is done before the shiplap is put on. Or in erecting these partitions, the end stud can be left out until the last, the backing nailed on and the stud put up as described for other interior partitions in Paragraph 59-c. If there is no stud in the wall which is next to the end of the partition, use 1"x6" backing, as shown in Figure 69. If there is a stud, then 1"x3" backing is used on each side of the stud, as shown in Figure 70.

(b) On Bearing Partitions

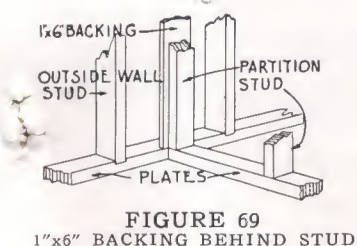


FIGURE 69
1"x6" BACKING BEHIND STUD

Backing is used on top of partitions in exactly the same way when the joists themselves are not so placed as to make a solid corner (see Figure 71). If the partition is not directly beneath a joist, then the two joists on each side of the partition must also be strengthened with 2"x4" BLOCKING. Nail this blocking on top of the backing and nail through into the joist (see Figure 72).

(c) On Top of Partitions

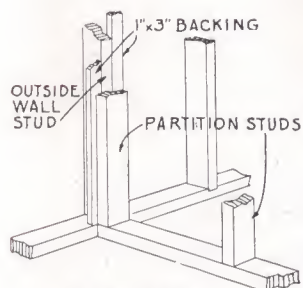


FIGURE 70
1"x3" BACKING BEHIND STUD

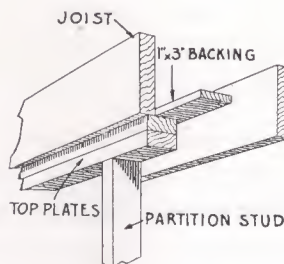


FIGURE 71
1"x3" BACKING ON TOP OF PLATE

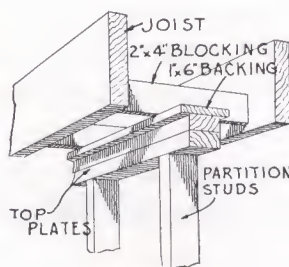


FIGURE 72
1"x6" BACKING ON TOP OF PLATE

61—BASE BLOCKS

- (a) In order to have a solid nailing for the ends of the base on the interior of the rooms, it is necessary to use base blocks. These are 2"x4"x9" and are branded or marked BASE. Base blocks stand on top of the bottom plate and against the studs in all corners of the rooms (see Figure 73). They must also be used against the door trimmers (see Figure 74).

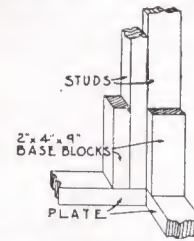


FIGURE 74

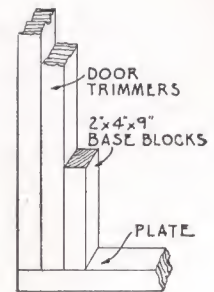


FIGURE 73

- (b) Nail these solidly into the studs or trimmers, as the case may be.

62—GROUNDS OR PLASTER GUIDES

- (a) Grounds are $\frac{3}{4}$ "x $\frac{3}{4}$ " strips against which the plaster stops. They can be put on any time after the partitions have been completed and before lathing.

For Base

- (b) A double row of grounds is provided at the bottom of all walls, to which the room base is later nailed. The bottom ground should be placed about 1 inch above the floor and the top one 6 inches above the floor (see Figure 75). These run around the bottom of both sides of interior walls or partitions and on the inside of exterior walls.

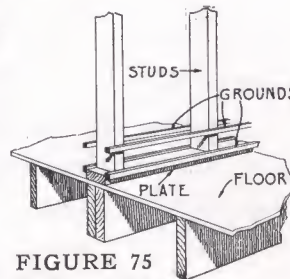


FIGURE 75
GROUNDS FOR
BASE

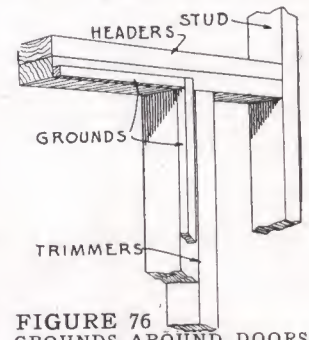


FIGURE 76
GROUNDS AROUND DOORS

Around Doors

- (c) A single ground is also to be nailed up the sides and over the top of all door openings. This ground is to be even with the trimmers at the side and the header at the top (see Figure 76).

- (d) No grounds are needed around the windows or outside doors.

- (e) Nail grounds onto studs with 6-penny casing nails.

Nailing

63—DORMERS

Bundled
Together

- (a) The various parts of dormers are similar to the corresponding parts of the main house and are built in just the same way. Most of the framing, walls and rafters are bundled together in small bundles ready to simply nail into the proper place, and these bundles must not be broken open until they are ready to use.

64—WINDOW AND OUTSIDE DOOR FRAMES

The sizes of windows marked on the plans is the glass size of each sash, not the full opening size of the window. For instance, a "26"x26" 2-lt." is a two-sash window and the glass in both the upper and lower sash is 26"x26".

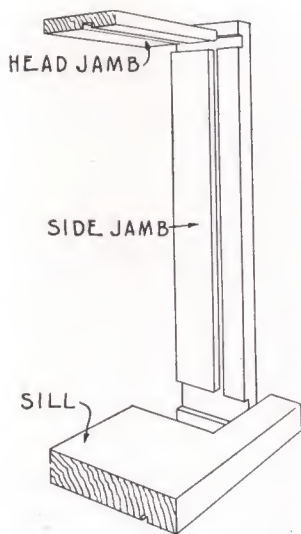


FIGURE 77
PUTTING A WINDOW
FRAME TOGETHER

The sizes of a single sash, like a dormer or attic sash, however, is given as the sash opening size in the frame.

Frames are bundled and tied together in separate bundles. All material for heads and sills is in one bundle, and all material for sides in another bundle. These bundles are marked 26" HEAD and 26" SIDE—thus it takes a head and a side bundle to make up one complete frame. For instance, it takes a 26" HEAD and 20" SIDE to make up a frame for a two-light 26"x20" window. Heads and sills for twin and triple windows are in one bundle. The mullion, that part of a twin or triple frame between the windows, is in another bundle. Therefore, a twin two-light window frame for 26"x20" window takes a MULLION 20", a SIDE 20", a TWIN HEAD 26".

Unfasten **one frame at a time**, set it up and nail it together. The sides are notched out and the head jamb and sill set into these notches (see Figure 77). Nail through the sides into the ends of a head jamb and sill.

The blind stop is then put on the outside edge of the jambs. This stop must project about 1/2-inch inside of the jamb and is flush with the back of the jamb (see Figure 78). Nail into the edge of the jamb.

Next, put on the 1 1/8-inch thick outside casing. The inner edge of the casing must be even with the face of the jamb. This will leave 1/2 of an inch of the blind stop projecting beyond the edge of the casing, against which screens will fit (see Figure 78). Nail through the face of the casing into the edge of the jamb. Put the drip cap on the top of head casing and nail down into casing.

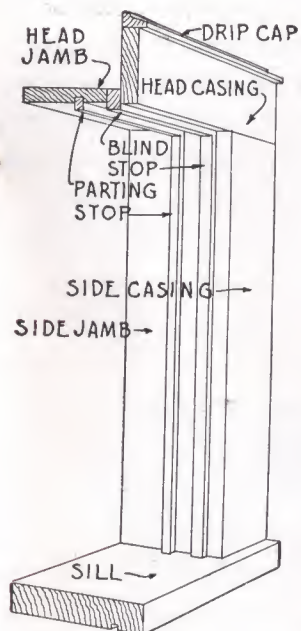


FIGURE 78
SECTION OF COMPLETE
WINDOW FRAME

In a good many cases the cornice frieze or belt (described in Paragraph 65-b) forms the head casing, in which case no head casing is to be put on the frame. The head casing and drip cap furnished can be used for some other purpose.

In assembling the window frames, set the parting stop in the groove provided for it. Do not nail it in until sash are set. The upper sash slides in the groove formed by the blind stop and parting stop.

On twin and triple window frames the sill is only partly cut through where the mullion jamb joins the sill. So it is necessary to knock out this small piece in the middle of the sill before setting the notched mullion jambs into sill.

Set outside door frames so that the distance from the top of the sub-floor to the rabbet in the head

(b)

Bundled
Frames

(c)

Putting
Together

(d)

Blind Stop

(e)

Outside
Casing

(f)

With Frieze

(g)

Parting Stop

(h)

Mullion
Window
Frames

(i)

Door Frames

jamb (into which the door sets) is 6'-9 $\frac{1}{4}$ ". (See Figure 79.) The sill will project about $\frac{7}{8}$ of an inch above the sub-floor.

Building Paper

- (j) Tack a strip of red rosin paper over the shiplap around all openings, so that it will project about 6 inches beyond the outside casing. On stucco houses use black water-proof building paper in place of red rosin paper. (See Paragraph 67-d.)

Installing Frames

- (k) Set the frames exactly in the center of the openings, block up between the lower header of the rough stud opening and the sill of the frame, so that the frames set perfectly level and plumb. Then nail through the outside casing and the shiplap and into the studs with 8-penny casing nails.

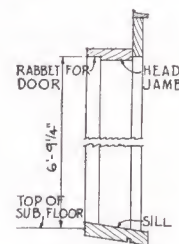


FIGURE 79
OUTSIDE DOOR
FRAME

On Stucco Houses

- (l) If the outside walls of the house are to be stuccoed, it is very important that before setting the frames you **bevel off the outside back edge of all casings, so that the stucco can be worked back of the casing.**
- (m) As soon as the frames are set, they should be primed. (See Paragraphs 86-a and 86-b.)

65—OUTSIDE FINISH

Outside Finish

- (a) The outside finish consists of the frieze, belt, base, corner boards, panel strips and any other finish pieces on the outside of the house. This finish is not cut to fit. Be very careful to cut it exactly, so as to secure tight joints.

Frieze

- (b) The frieze is a $\frac{3}{4}$ -inch thick piece which fits against the shiplap and up under the cornice (see Figure 80). This frieze must be furred out with two $\frac{3}{8}$ "x $\frac{3}{4}$ " furring strips laid flat against the shiplap. These furring strips run in the same direction as the frieze, one being placed about 1 inch above the bottom of the frieze and the other about 1 inch down from the top. This allows the top piece of siding or wall shingles to slide up under the frieze. Where the frieze forms the head casing to a window or door frame, the lower piece of furring must be brought down so that it is even with the bottom of the frieze (see Figure 81). When a frieze runs up the slope of a gable end, the lower furring strip must also be even with the bottom of the frieze. This will make a tight joint where the ends of the siding butt up against it.

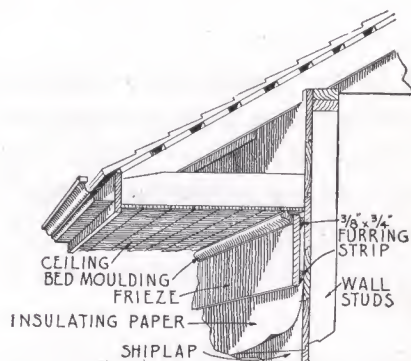


FIGURE 80
FINISHED CORNICE

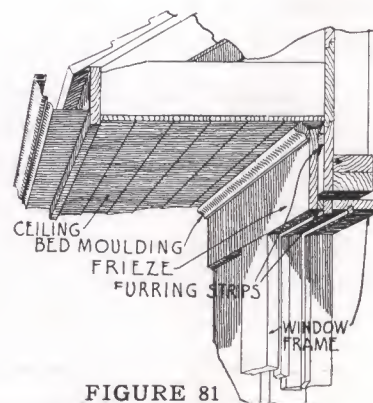


FIGURE 81
FRIEZE OVER WINDOW

On open cornices it is necessary to notch out the top of the frieze, so that it will fit up around the rafters which project through.

- (c) Frieze on Open Cornices
- (d) Bed Moulding

Cover the joint between the frieze and the cornice ceiling with a bed moulding of the design number shown on the WALL SECTION. (See Figures 80 and 81.)

All belt courses are furred out and put on exactly in the same way as the frieze.

- (e) Belts
- (f) Corner Boards

The corner boards are $1\frac{1}{4}" \times 4"$ and $1\frac{1}{4}" \times 5"$, and are put on all vertical corners of houses covered with siding, except where siding is to be mitered together at the corners. These are shown on ELEVATIONS. As the corner boards are $1\frac{1}{4}$ inches thick, they are nailed tight to the sheathing without any furring. Thus the outside of corner boards, friezes and belts are flush or even. Put on the 4-inch corner board first, bringing the corner edge of it even with the shiplap. Then put on the 5-inch corner board, bringing the edge of it even with the face of the 4-inch one (see Figure 82). Nail the side of the 5-inch corner board into the edge of the 4-inch one and nail both corner boards into the shiplap.

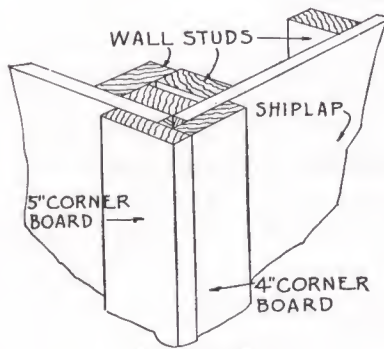


FIGURE 82
CORNER BOARDS

The base, when shown on ELEVATIONS, is $\frac{3}{4}$ -inch thick. It is put on without furring and is located as shown on the ELEVATIONS and SECTIONS. Bring the bottom of the base down so that it will not only cover the bottom of the shiplap, but will project about $\frac{1}{4}$ -inch below (see Figure 83).

- (g) Base

Put on any drip caps, covers or other mouldings, as shown on the ELEVATIONS and WALL SECTION. In each case the design number of the moulding is shown on the blue prints, and a corresponding number will be found on the moulding package.

- (h) Mouldings

Before putting on any of the outside finish described above, tack a strip of red rosin paper under it. Allow the paper to project about 4 inches. On stucco houses black water-proof building paper is used instead of red rosin. (See Paragraphs 64-j and 67-d.)

- (i) Building Paper

Nail all $\frac{3}{4}$ -inch thick outside finish with 8-penny casing nails and $1\frac{1}{4}$ -inch thick with 10-penny. Drive all nails in carefully, so as not to make any hammer marks on the finish. Set the heads in below the surface of the board with a nail set. As soon as the outside finish is put on it must be primed to keep it from the weather. (See Paragraphs 86-a and 86-b.)

- (j) Nailing

66—PORCHES

Porches are built up in the same way as the main house. You will have no difficulty if you will follow the drawings very carefully. In laying the

- (a) Porch Flooring

porch flooring, the joints between the flooring should be given a thick coat of paint just before they are laid. Then nail the flooring down to the joists while the paint is still fresh. The porch flooring is furnished slightly longer than the width of the porch. After it is all laid, snap a chalk line along the outside edge and cut off the ends of the flooring to this line. Blind nail porch flooring with 8-penny casing nails at each joist.

Porch Ceiling (b) Porch ceilings are finished with $\frac{5}{8}$ "x4" beaded ceiling laid in the same direction as the flooring below. Blind-nail the ceiling to each ceiling joist with 6-penny casing nails.

**Columns
Balusters** (c) Where porch columns are shown, it is better to support the roof with a 2"x4" stud temporarily, until the roof is all finished. Then cut off the columns on the bottom end so that they fit accurately and nail them in. Square porch balusters are spaced three to one foot, unless otherwise marked on the drawings.

Porch Steps (d) Wooden porch steps are **included with the lumber shipment** and must be put together on the job. The outside horses are of finish lumber and the center ones are of the same material as the framing lumber of the house. Do not get them mixed. The horses are furnished cut out for the treads and risers. The treads and risers are bundled together and branded or marked PORCH STEP, followed by the length. Be sure to use the correct length in each set of porch steps, as shown on the plans. Locate and set the horses as shown on FLOOR FRAMING PLAN. Nail up to the porch floor joists. These horses should be hung from the porch floor joist by 2"x4" blocks, nailed to the joist and to the side of the horses. Next put in the risers, which are $\frac{3}{4}$ "x6 $\frac{3}{4}$ ", and nail them into horses with 8-penny casing nails.

Treads Lay the treads, which are made up of two pieces 1 $\frac{1}{4}$ "x6". Set the back piece of the tread tight against the riser and nail into the horses with 10-penny casing nails. Then set the front piece of the tread, leaving a $\frac{1}{2}$ -inch open space between the two pieces. Nail this piece into horses and also into the top of the riser. Finish the under side of the tread—that is, the joint between the tread and riser with a piece of cove moulding No. 8060. Mitre this at corners and return back under ends of the treads.

67—PAPER ON OUTSIDE WALLS

**Cover
Shiplap
with
Paper** (a) As described in Paragraphs 64-j and 65-i, red rosin building paper is to be put on over the shiplap wall sheathing and under the outside casings of frames, under friezes, belts, bases, corner boards and panel strips, and so as to project slightly beyond. Before the wall siding or wall shingles are put on, the entire balance of the outside wall is to be covered with red rosin paper put on horizontally—that is, running around the building. Hold this in place temporarily with lath nailed over the paper into the shiplap.

Lap Paper (b) Lap the ends of this paper over the ends projecting from behind casings and other outside finish. Lap each strip of the paper about two inches.

Water-proof building paper is required on some houses, on rather flat roofs, under the shingles. When so shown on the WALL SECTION, lay it over the roof sheathing before the shingles are put on. Lap the paper 2 inches and run it as far up the roof as shown on the drawings.

(c) Water-Proof Paper

In the case of stucco houses, use black water-proof building paper instead of red rosin paper, but apply in exactly the same way.

(d) Stucco Houses

68—BEVEL SIDING

If the exterior of the house is covered with bevel siding, start at the bottom of the wall. Bring the first piece of siding out over the lip of the drip cap on the base (see Figure 83).

(a) Start at Bottom

In spacing the siding, divide the spaces between the bottom of the bottom board and the bottom of the window sill into equal parts of about $4\frac{1}{2}$ inches for 6-inch siding. The same procedure should be done between the bottom of the window sill and the top of the window frame, and so on up the wall at each break caused by a window, door or other opening. No pieces of siding should be notched out to fit over or under a frame. Thus the bottom line of each siding board runs through, without break, from opening to opening (see Figure 84).

(b) Spacing Siding Between Openings

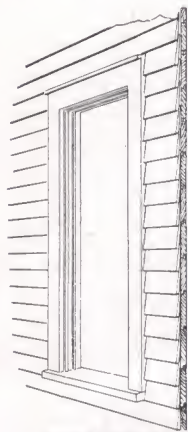


FIGURE 84
BEVEL SIDING AT
WINDOWS

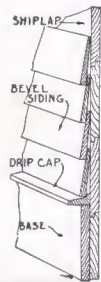


FIGURE 83
BEVEL
SIDING

Six-inch bevel siding should be spaced about $4\frac{1}{2}$ inches to the weather, as described above, 4-inch bevel siding about $2\frac{3}{4}$ inches to the weather, 8-inch bevel siding about $6\frac{1}{2}$ inches to the weather, and 10-inch bevel siding about $8\frac{1}{2}$ inches to the weather, unless some other spacing is marked on the ELEVATIONS.

(c)

No bevel siding is cut to fit. It is necessary to cut each piece very carefully to fit exactly and to make perfectly tight joints at the ends. Four-inch and 6-inch siding is nailed with 7-penny box nails, and 8-inch and 10-inch siding with 8-penny common nails.

(d) Fitting and Nailing

Prime the siding as soon as it is put on, as described in Paragraphs 86-a and 86-b.

(e) Prime Siding

69—SHINGLED WALLS

If the exterior walls of the house are covered with shingles, space out the courses of shingles in the same way as described for the siding in Paragraph 68-b (see Figure 84). Shingles on the walls are laid with an exposure of 5 inches to the weather, unless otherwise marked on the ELEVATIONS. The bottom row or course of shingles is to be doubled. Any shingles wider than 8 inches should be split into two shingles. Nail each shingle with two 3-penny shingle nails, far enough above the butt end so that the nail will not

(a) Fill Corners

Spacing and Laying Shingles

show when the next course is put on. The side wall shingles are put on in much the same way as previously described for roof shingles. See Paragraph 86-h regarding shingle stain.

70—STUCCO WALLS

Water-Proof Paper

- (a) If the exterior of the house is covered with stucco, the shiplap sheathing is first covered with black water-proof building paper instead of red rosin, as described in Paragraph 67-d.

Flashing

- (b) Everything that is possible must be done to keep water from getting behind the stucco. Wherever a roof or other surface butts up against a stucco wall be sure that the joint is flashed with tin (see Paragraph 51-b) before applying the metal lath.

Flash the top of all window and door frames which are not under porch roofs or up under the cornice, protected from all rain water, with a strip of tin about 7 inches wide (see Figure 85). In order to prevent water from running off of the ends of window sills down onto the stucco and streaking it, nail small pieces of tin to the ends of the sills. Be sure these are nailed tight and well painted, so that the water will not run between the end of the sill and the tin (see Figure 86).

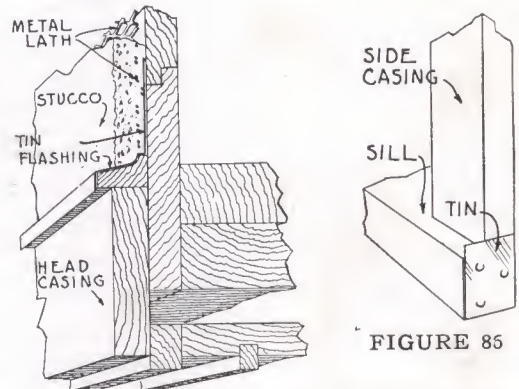


FIGURE 85
FLASHING OVER WINDOWS

Metal Lath

- (c) The metal lath furnished is a corrugated lath—that is, “self-furring” and requires no furring strips. The corrugations are those parallel ridges which are 4 inches apart. The lath is furnished in sheets and is to be put on horizontally around the building, not vertically up and down. Put on the lath so that the corrugations or ridges go against the sheathing, so as to hold the body of the lath away from the building. In this way these corrugations act as furring strips. This lath has a top and bottom to the sheet and is not reversible, so when you put it on be sure that it is turned so that the joints between each small mesh face upward and, therefore, form a small ledge (see Figure 87). Lap the ends and sides of the sheets by about 1 inch, and nest the ribs of one sheet into the next one. Work from the top down.

PUT ON SO THE MESHES
TURN UPWARD

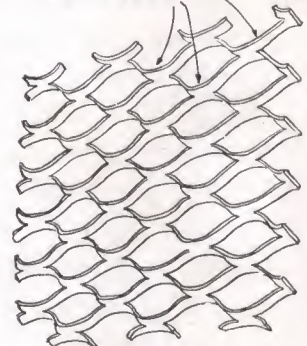


FIGURE 87
METAL LATH

Corners

- (d) On corners use a sheet of flat or uncorrugated lath about 14 inches wide, bending around the corner, leaving about 7 inches on each side. Nail securely. If this is not done the corner will crack.

Nail the metal lath to the sheathing with 6-penny nails, nailing through each corrugation about 4 inches apart. Drive the nail in $\frac{7}{8}$ of an inch and bend the rest of the nail over with a hammer, thus clinching the lath to the sheathing. It is important that the nails are bent up, not down or sideways, so that the nails will give the greatest support to the weight of the stucco.

(e) Nailing

The best stucco for metal lath is a cement stucco, although any of the patented stuccos on the market may be used with satisfaction. If a patented stucco is used, be sure to **have the plasterer and the manufacturer give you an absolute guarantee of a perfectly satisfactory and water-proof job.** The manufacturers of all patented stuccoes have directions for putting on their product. If you use one of these, be sure that they make a water-proof stucco or give instructions for thoroughly water-proofing it. Insist on having the manufacturer's directions for mixing and applying the stucco followed carefully and thoroughly.

(f) Cement Stucco

Patent Stucco

If you make your own cement stucco, use any acceptable make of American Portland cement. The sand must be clean, and the water clean and free from oil, acid, strong alkali or vegetable matter.

(g) Materials for
Cement Stucco

The principles underlying the preparation, proportioning, mixing and application of Portland cement stucco are very simple, and can be easily understood by the average plasterer. A more uniformly good quality of stucco will result if the materials come onto the job either completely mixed ready for the addition of water, or if in properly proportioned packages ready to mix together. Also, the exact coloring and mixing can be done better when the stucco is prepared in a factory under expert supervision. This gives the advantage of factory measured and proportioned materials, machine mixing, grinding of the color pigment with the cement and selected materials.

(h) Factory Pre-
pared Stucco
Is Best

Mixing of mineral coloring pigments with the finish coat should only be done on the job when prepared machine-mixed materials for this coat cannot be purchased in the desired colors. Then, if it is desired to add color to the stucco, use only mineral coloring, and then only if it is found that the natural colors of the sand with either gray or white cement do not produce the desired effect. Any but mineral coloring pigments are liable to fade under the action of the lime in the stucco, and they may also weaken the stucco. The best way to determine the amount of color required is to make up several panels of stucco to choose from. Colors always appear darker when moist, so the older the panels are, the better. It is best to use a machine mixer and mix all of the colored stucco at one time. If this cannot be done, and it is necessary to mix in small batches, take extreme care to color each batch exactly alike or the whole job will be mottled in color. Weigh out the coloring matter carefully for each batch.

(i) Coloring

If the stucco is to be mixed on the job an ordinary mortar box will probably be sufficient, although a machine mixer is recommended. Use a one cubic foot measuring box (see Figure 4) and measure 16 cubic feet of sand

(j) Mixing Stucco

into the mortar box and mark its level in the box. In future mixes fill the mortar box to this line. Add five sacks of Portland cement and one sack of hydrated lime to the sand. Mix thoroughly together, while dry, to an even uniform color. Add water until the stucco is of the proper consistency to work easily.

Applying Stucco

- (k) The first, or scratch coat, is the most important in giving strength to the slab of stucco; the second, or brown coat, to even out and smooth up the stucco, and the finish coat to create the texture desired. Three-coat stucco work must always be used on metal lath over framing. In putting on the scratch coat press the stucco through the meshes of the metal lath so that the back side of the metal lath will be completely covered. Allow each coat to set, but not dry out, before applying the next one. In dry or warm weather dampen the stucco between coats. Do not put on stucco when the temperature is below freezing. The second coat should be completed over the whole house before the finish coat is started, as this eliminates the mar-
ring of the finish coat and leaves the building clean.
- (l) The total thickness of the stucco from the sheathing should be about 1 inch.

71—INTERIOR LATHING

Where to Lath

- (a) Be sure that backing has been placed in all corners, so as to make perfectly solid corners, as described in Paragraph 60. All inside walls and ceilings are to be lathed and the soffits (the sloping under side) of all stairs, except basement stairs.
- (b) Lath on walls are to be put on horizontally and they must be spaced $\frac{3}{8}$ of an inch apart, no more and no less. Do not run lath past the back of a partition from one room to another, as this will make a crack at the corner from the floor to the ceiling. Joints between the ends of the lath should be broken at every eighth lath. That is, do not put up more than eight lath above one another, but start the ninth lath on another stud.
- (c) Nail each lath to each stud or joist, as the case may be, with one 3-penny blue lath nail.

Nailing

72—WINDOWS

Uncrating

- (a) The crates in which windows and doors are packed are nailed together with a coated nail. This nail holds fast in the wood, thus enabling the crate to withstand a great deal of handling without breakage. For this reason, use a claw-hammer in uncrating and draw the nails out slowly and steadily. A piece of wood or cardboard should be placed under the hammer head, so as not to mar the window or door.

Fitting Edges

- (b) It will be necessary to plane the sash a little in order to make them fit and slide properly. Plane the edges of the window, where they set between the stops in the frame, on a slight bevel rather than straight across (see Figure 88). This will prevent the sash from binding and from rattling.

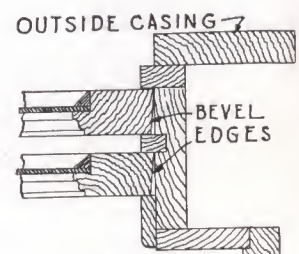


FIGURE 88
SASH IN FRAME

To hang the window, push the sash cord through the pulley in the frame. Draw down the cord through the opening in the side of the frame and tie the cord to the weight. Then cut the cord to the proper length. For the upper sash of the window, the weight does not quite touch the bottom of the frame when the sash is closed. For the lower sash of the window, the weight does not quite touch the bottom of the frame when the sash is wide open. Knot the cord and drive into the opening on the edge of the sash. A brad driven through the cord will keep it in place better. Be sure that the knot does not project beyond the edge of the window or it will cause the window to bind.

Fit and hang the top sash first and then the bottom. Plane the lip on the check-rail between the upper and lower sashes so that the two sash fit snugly together.

After the windows are in place, and before plastering, hang temporary doors in all outside door openings. No finish doors should be hung until the plaster is dry, as they will warp from absorbing too much moisture from the plaster.

Weights furnished for each sash in two-light windows used the most are as follows:

3½-pound for Sash 26x14	5½-pound for Sash 26x24
5-pound for Sash 26x20	6-pound for Sash 26x26
9-pound for Sash 38x26	

73—INTERIOR PLASTER

After lathing, put metal corner beads on all exposed wall corners throughout the interior of the building (see Figure 89). These must be nailed on

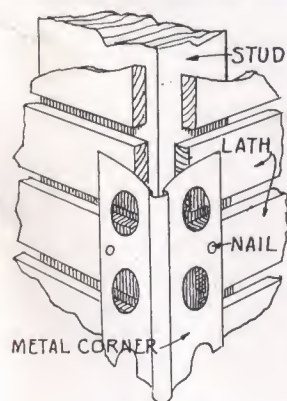


FIGURE 89
INTERIOR METAL CORNER

so as to make a perfectly straight and plumb corner. The outside edge of the metal corner will project $\frac{3}{8}$ of an inch beyond the lath. Nail with 3-penny lath nails at each nail hole.

The entire interior of the building which has been lathed is to be plastered with three coats of hard wall plaster, except the lower part of the walls of the bath-room or wainscot. Use a patent plaster and put it on in strict accordance with the directions of the manufacturer, so as to make a finished job $\frac{3}{4}$ of an inch thick, including the lath.

Before any plaster is applied, all wood lath must be thoroughly soaked with water. Soak them several hours before plastering and again just before the plaster is put on. **This is very necessary in order to prevent cracking of the plaster.**

The bath-room is to have a wainscoting to a height of 4'-6" from the floor, composed of three coats of Keene's cement. This must be put on in accordance with the manufacturer's directions, and may be blocked off into an imitation of tile if desired.

(c) Sash Cord

(d) Check Rail

(e) Temporary Doors

(f) Sash Weights

(a) Metal Corners

(b) Plastered Walls and Ceilings

(c) Soaking Lath

(d) Bath-Room Wainscot

Maintaining Heat

- (e) If plastering is done in winter a fire must be kept up in the house and the windows left slightly open so that the moisture is driven out. Allow ten days or two weeks for the plaster to dry out, before any finish woodwork is applied.

74—INTERIOR TILE WORK

Tile Floors

- (a) Where tile floors are to be laid, the floor joists are to be beveled off and a rough floor laid on 1"x2" strips nailed in between joists (see Figure 90).

Rough Floor

- (b) The bed into which the tile floor is to be laid consists of a 2-inch bed of concrete, on top of which is a 1/2-inch bed of mortar (see Figure 91).

Laying Floor Tile

- (c) Lay water-proof building paper over the rough floor and up and over the beveled joist. Lap the paper 2 inches and turn it up 2 inches against the walls. Put in the 2 inches of concrete. The concrete to consist of one part Portland cement, two and one-half parts of sand and five parts of gravel. Five pounds of hydrated lime are to be added for each bag of cement. The 1/2-inch mortar bed, laid over the concrete, to consist of one part Portland cement to three parts of sand. If the concrete bed has become set and dry, sprinkle it good and wet before the mortar bed is spread. Just before setting the tile, Portland cement shall be dusted uniformly over the mortar bed. The tile are to be placed upon and firmly pressed and tamped into the mortar until exactly true and even with the top of the finished floor.

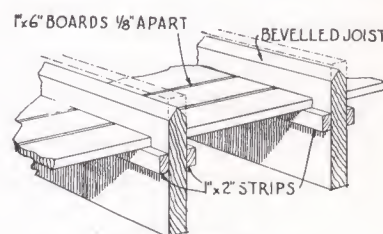


FIGURE 90
FLOOR PREPARED FOR TILE

Joints

- (d) For Mosaic tile, the joints between the sheets shall be kept the same width as those between the mounted tile on the sheet, otherwise each section will show where they join.

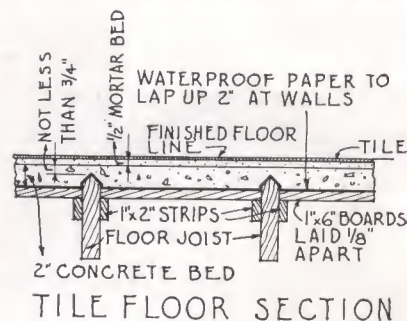


FIGURE 91

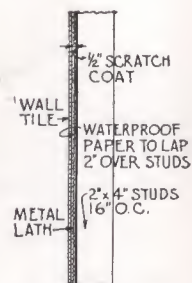
Wall Tile

- (e) Where wall tile are used, proceed as follows:

Cover the studs with water-proof building paper. Over this apply metal lath, nailing to each stud with 6-penny nails. Space nails about 4 inches apart and drive them half way in, and turn them up and bend back to the lath. Put a 1/2-inch thick scratch coat of mortar on the metal lath. Mortar to be the same as for floor tile (see Figure 92).

Laying Wall Tile

- (f) The scratch coat shall be applied not less than 24 hours nor more than 48 hours before commencing to set tile on wall. Before it is dry it should be scratched horizontally about 1 inch apart. The scratch coat should be sprinkled with clear water just before setting the tile. Over the scratch coat apply a setting bed of mortar about 1/4 of an inch thick. Apply a thin coat of neat cement to the back of each tile,



TILE WALL SECTION
FIGURE 92

or over the setting bed, and press the tile into place. As soon as the mortar setting bed has sufficiently hardened the tiles on the walls shall be well washed with clear water and the joints be filled with Portland cement mixed with water to the consistency of thick cream. This shall be forced into the joints, sprinkled with dry cement and finished flush and true. All surplus cement to be removed from the face of the tile before it hardens.

75—INTERIOR FINISH

Be sure that the plaster is thoroughly dry before any doors, interior jambs or finish are put up. The length of time required for the plaster to dry will depend on weather conditions; usually at least one full week will be needed.

Interior door frames or jambs are set up first. Set the head jamb into the notches in the side jamb and nail through the side into the end of the head with 8-penny common nails. Set the frames in place so that the measurements from the **finished** floor to the under side of the head jamb will be 6'-8½". Set the frames perfectly level and plumb. Block the frame tightly in between studs, using any odd pieces of lumber for blocking. Block in behind where the door butts or hinges and where lock will set.

All door and window trim is furnished in the proper approximate lengths for each opening. Before cutting any interior finish, **lay it all out for each opening**, so as to save any unnecessary cutting which may be wrong. The trim is furnished in pieces slightly longer than required and must be cut and fitted on the job, as this is the only way to secure a tight and workman-like job.

The design number of the trim is marked on the WALL SECTION, and all packages or bundles of trim are marked to correspond.

On windows, the stool is put in first. Fit it tight against the lower sash, and with a notch cut out on each end so that it will fit around the jamb and tight against the plaster. The stool should project 5½ inches on each side of the window opening (see Figure 93). The apron is put on next, under the stool. The apron projects 4¼ inches on each side of the opening.

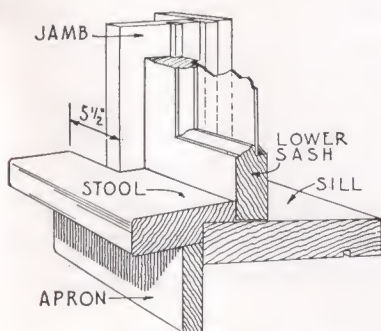


FIGURE 93
WINDOW STOOL AND APRON

The side casings are put on next. These reach from the top of the stool to the head jamb of the frame. Cap with the head casing, which is cut to the proper length so that the ends of the head casing are even with the sides of the side casings (see Figure 94).

The inside edges of the window casings are to be even with the window jamb. Then put on the back band, mitering it around the side and head casings. Window stop is then cut and fitted in carefully, so that bottom sash will slide easily, but will not be loose.

(a)
Interior
Door Frames

(b)
Locating
Proper Pieces

(c)
Window Stool
and Apron

(d)
Putting On
"Craftsman"
Window Trim

Putting On
"Craftsman"
Door Trim

- (g) The doors are cased in a similar manner, except that there is no stool or apron and the back band runs down to the finish floor (see Figure 95). No base blocks are needed with "Craftsman" trim. Inasmuch as the finish floor is not put in until after all interior trim is on, use a small piece of finish flooring to set under the bottom ends of door side casings to get the correct length of the casings. Do not nail this piece of flooring down, simply use it as a measure of the thickness of the flooring. The door casings must be set back $\frac{1}{4}$ of an inch from

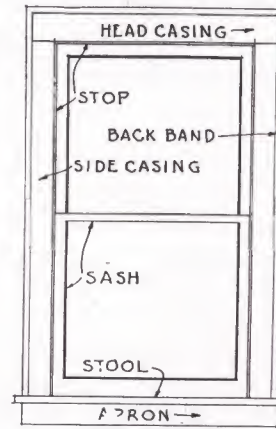


FIGURE 94
INTERIOR ELEVATION OF
CRAFTSMAN WINDOW
TRIM

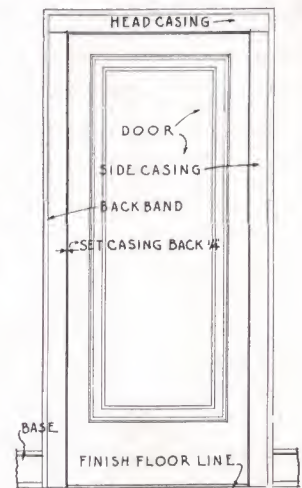


FIGURE 95
INTERIOR ELEVATION OF
CRAFTSMAN DOOR TRIM

the face of the jamb, as this allows room for the door butt or hinge. Set the stop so as to fit against the door. If the measurements shown on the drawings have been followed carefully, it will be found that the head casings of the doors and windows are on a line—that is, the same distance from the floor.

Interior
Base

- (h) After all doors and windows have been cased, the base may be put down. This is furnished for all rooms and closets. Set the base so that the top is on a level line and nail through to the grounds. Allow for the thickness of the finish floor in setting the base. Put the base moulding on top of base and nail it in with nails slanting, so as to draw it up tight to both the base and the plaster. Do not put the carpet strip (base shoe) down until the finish floor has been laid. Then it must be nailed to the floor, so that if the house settles a little the base shoe will settle with the floor, sliding along the base and thus keep a tight joint at this point.

Chair Rail

- (i) A chair rail, or wainscoting cap is furnished for covering the joint between the Keene's cement wainscoting and the plaster above it in the bathroom. This is the same size and design as the casings, except that it has no back band. Nail this on, being careful to get it level all around the room.

Closets

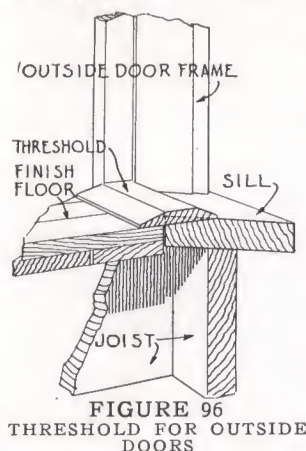
- (j) Closets are finished in exactly the same manner as the room from which they open, except that no back band is used around door casings and no moulding on base. All closets have one or more shelves, as noted on FLOOR PLAN. The shelves set on a cleat or hook strip, which runs around the walls of the closet. Set the hook strip about 6 feet from the floor. This hook strip is of the same design and size as the window apron.

76—DOORS

Mortising and
Hanging
Doors

- (a) It is necessary to plane and fit all doors very carefully to the door frames or jambs, so that they will fit as tight as possible without binding. Doors are furnished mortised for locks. Be sure to hang the doors so as to swing in the directions shown on the FLOOR PLANS. The mortises for the hinges

or butts must be made on the job, as this will secure a better hanging door. Mortise the edge of the door to the size and depth for one leaf of the hinge and the jamb for the other leaf. In setting inside doors, saw them off on the bottom as may be necessary, so that they will clear the floor by $\frac{1}{2}$ of an inch. A threshold is provided to place under all outside doors and doors leading to the basement. Plane off the top of the sill which projects above the finish floor (as shown in Figure 79 and described in Paragraph 64-i) so that it is even with the finish floor. Fit the threshold as shown in Figure 96



so that it covers the joint between the sill and the finish floor. Paint all doors on the top and bottom edges just as soon as they are fitted and hung. Notice particularly that 4"x4" butts are furnished for doors $1\frac{3}{4}$ inches thick, and $3\frac{1}{2}" \times 3\frac{1}{2}"$ butts for doors $1\frac{3}{8}$ inches thick. Two butts are furnished for all interior doors. Three butts are furnished for all exterior doors. After fitting the doors and hardware, take off the locks. Do not put them on until the interior painting and varnishing is finished (see HARDWARE, Paragraph 84-c).

Threshold

Door Butts

77—BASEMENT STAIRS

The material for the basement stairs is furnished with the carload of lumber and is cut to fit. Put in the rough horses. Follow carefully the positions and measurements, as shown on the PLANS AND SECTIONS OF THE BASEMENT STAIRWAY. The horses are 2"x6", and blocks for the steps are to be spiked to the horses. The sizes of these blocks are marked on the SECTIONS and on the blocks themselves. Be sure to select the correct ones for each place, and do not confuse with the main stair blocks, which are of slightly different size. The treads are 2"x10" planks and are nailed on top of the blocks, as shown on the drawings. There are no risers and the back is left open.

(a)
Rough Horses

Treads
Risers

78—GRADE STAIRS

Grade stairs—that is, the stairway from the first floor to the grade door—are furnished with the carload of lumber and are cut to fit. The rough horses and stair blocks are assembled and set up the same as the basement stairs. The treads are $1\frac{1}{8}" \times 11\frac{1}{2}"$ and the risers $\frac{3}{4}"$ thick, and of the proper width. A $\frac{3}{4}" \times 11\frac{1}{2}"$ wall string is furnished, between which the treads and risers are to fit. Carefully lay out and mark the wall strings so as to show the line of each tread and riser. Nail through the back of the string into the ends of treads and risers, and nail the treads and risers to each other. Then set the entire stairway in place as one unit.

(a)

79—ATTIC STAIRS

The material for the attic stairway is also included with the carload of lumber, and is built in exactly the same way as the grade stairs.

(a)

- (b) While the width of the treads and risers is cut at the mill, it is necessary for you to cut each to the exact length. Also cut off the strings to the proper lengths and mitre the ends to the base.

80—MAIN STAIRS

Rough Horses

- (a) The rough horses and blocks for the main stairway are built in the manner as previously described for attic, grade and basement stairs. Go over the detail drawings of the framing for the stairway and landings (or platforms) carefully. Put each piece in its exact place and to the exact height shown on the details.

- (b) Do not build the finished main stairs until the plaster is dry.

Cutting Treads and Risers to Length

- (c) See Figure 97 as an illustration of the various parts of a finished stairway. Cut the wall strings so as to meet the base (see Figure 98). For a boxed stairway (Figure 103), cut off all treads and risers, except the top risers, so that their length is 1 inch shorter than the distance between the plaster. For an open stairway (Figure 97), cut the length of the treads 2 inches longer than the distance from the face of plaster beside the stairway to the face of the plaster on wall under the stairway. Cut off the square end of risers so that the edge of the mitre on the end of the riser is even with the outer end of the tread, where the tread is dovetailed for the balusters.

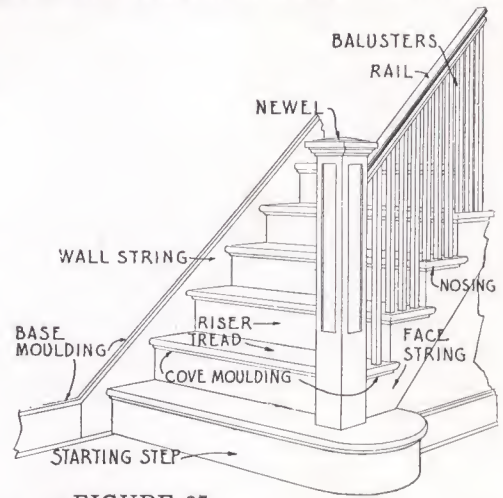


FIGURE 97
A FINISHED STAIRWAY

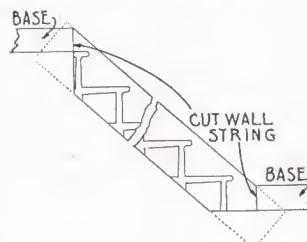


FIGURE 98
CUTTING WALL STRING

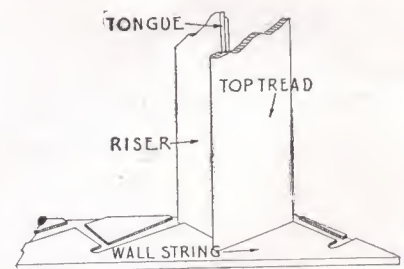


FIGURE 99

Putting In Treads and Risers

- (d) Set a wall string flat on top of two saw horses. Put in the top tread and next riser (see Figure 99), glue the tongue of the riser where it fits into tread. Dip wedges in glue and drive in as shown in Figure 100. Continue down the stairway in the same manner. Be careful to keep the whole stairway true and square. Put on the wall string on opposite side if a closed stairway, or the face string if an open stairway. Cut out the top end of the wall string for the top riser, as shown in Figure 101. Cut off the top riser so that it will be long enough to go through the wall string. Set it and the landing step in as shown in Figure 102. Put on the string on the opposite side. Nail through the wall string into the ends of the treads and risers. (See Figure 103.) Nail

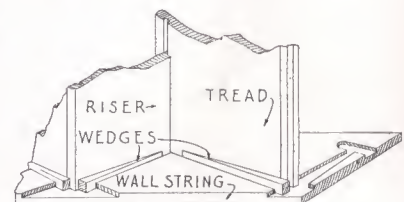


FIGURE 100

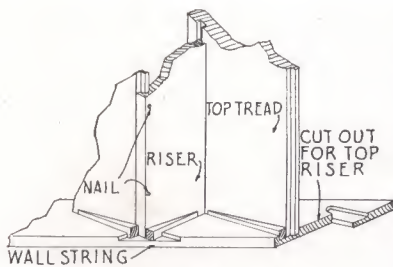


FIGURE 101

through the risers from the back into the treads next to them with 6-penny finish nails about 10 inches apart (see Figures 101 and 102).

Set each flight of stairs into position. It is not necessary that the finish stairway fit the rough stair blocks. These blocks need only be used to make temporary stairway before finished stairway is built. If the stair blocks interfere with finish stairway,

(e)

Setting Up
Stairway

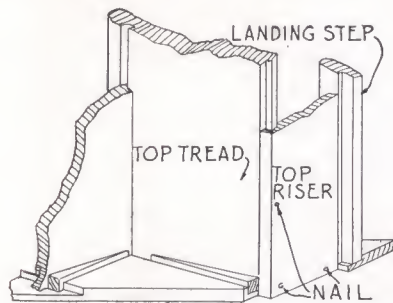


FIGURE 102

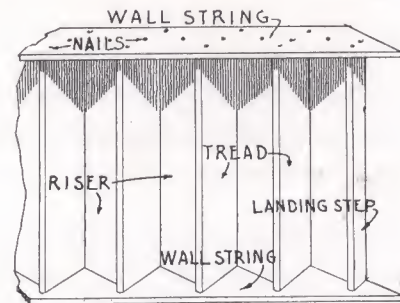


FIGURE 103
A BOXED STAIRWAY

knock them off of the horses, being careful not to jar the plaster below. Build in the newels, rails and balusters as shown on the drawings. Be very careful to have each part of the stairway fit tight, square and true. Bevel the edge of the wall string to meet the thinner base. Put on base moulding on top of wall string.

In some houses there may not be room enough to build the stairway and then set each flight in position as one unit. In this case it is necessary to build the stairway in place as you go along. Follow the same general method as previously outlined.

(f)

Go over your job with nail set, plane and sandpaper and finish up in a neat workmanship-like manner, ready for varnishing.

(g)

Finishing

81—FINISH FLOORS

Clean off the sub-floor thoroughly. Cover with a well lapped layer of red rosin paper before laying the finish flooring. Lay the flooring, which is furnished in random lengths. Drive each piece up tight and blind nail it to the sub-floor. Use 8-penny casing nails for 13/16-inch thick fir, oak or maple flooring and also for 3-inch yellow pine flooring; 4-penny finish nails are to be used for all 3/8-inch thick oak or maple flooring. Run the flooring through all doorways from one room to another. Lay all finish flooring 1/2-inch away from the walls of the room to allow for expansion. Fit the flooring under bottom ends of door casings and back band carefully.

(a)

Building
Paper

After the flooring is laid, put down the base shoe, as described in Paragraph 75-h.

(b)

Base Shoe

All finish floors should be scraped around the edges before the base shoe is put down.

(c)

Scraping

- (d) After all other work has been done, plane, scrape and sandpaper the floors as may be necessary, so as to leave them absolutely clean, level and smooth, ready for the varnishing.

82—CASES OR CUPBOARDS

- (a) Complete details for assembling all "stock" cases are packed in with the case. For "special" cases a detail is shown on the blue prints. If these details are followed carefully no trouble will be experienced. The assembling of cases is very simple.

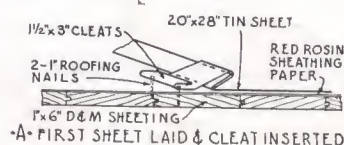
83—TINWORK

- (a) Tin flashings are described in Paragraph 51. Gutters and down spouts, in Paragraphs 50, 56, 57 and 58; ridge roll and hip shingles, in Paragraphs 52-d and 53-h; flashings over windows (on stucco houses), in Paragraph 70-b, and corner beads for interior plaster, in Paragraph 73-a.

Tin Roofs

Laying

- (b) The tin for tin roofs and decks shown on the drawings is furnished in 20"x28" sheets. Before applying the tin, cover the entire roof with a well lapped layer of red rosin sheathing paper. Turn the edges of tin sheets under 1/2-inch. All seams to be well locked and well soaked with solder. Fasten sheets to sheathing by 1/2"x3" cleats cut from the tin, spaced 8 inches apart. Lock cleats into seams and fasten to roof with two 1-inch roofing nails. Do not drive any nails through the sheets. See Figure 104 as an illustration of the various operations in laying a tin roof.



Keep Roof Clean

- (c) Do not walk over tin roof any more than is necessary. Do not store material on it. Rubber-soled shoes or overshoes should be used by men on the roof.



Painting

- (d) Paint the exposed surface of all tinwork, except tin roofing sheets, with one coat of metallic roofing paint. On tin roofs, first clean all surfaces of the tin, carefully removing all traces of flux. Paint with one coat of metallic roofing paint within three days of the laying of the tin. Give it another coat before the building is completed.



84—FINISH HARDWARE

Packed In Separate Boxes

- (a) All finish hardware is very carefully packed in boxes or cartons, and these boxes are packed in larger cases. Each case is labeled to show just what is in it, and a label also appears on each individual box. The complete set of hardware, including catches, hinges and drawer pulls for each kitchen or pantry case, colon-

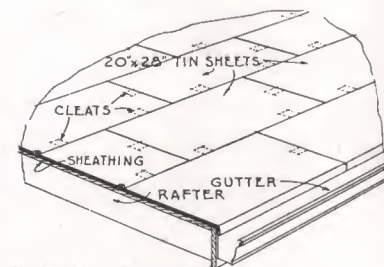


FIGURE 104
OPERATIONS IN LAYING TIN ROOF

nade and buffet is packed in a separate small box, each one by itself. In a medicine cabinet, towel case or ironing board, the box of hardware is packed inside of the cabinet to which it belongs.

Care must be used in unpacking to look carefully at each box. If some boxes are opened for inspection, close them when they are laid down. Otherwise the hardware will become mixed up and the screws not only mixed up, but lost. Do not scatter these boxes, or the hardware in them, all around the job. Keep each in its original package until you are ready to use it.

(b) **Do Not Mix
Up Hardware**

The various sizes and uses of the door hinges or butts are described in Paragraph 76. Be sure to select the correct ones for each place. After the doors have been hung put a base knob in the base, behind the door, so that when the door opens it will bump against this knob. Top and bottom mortise bolts are furnished for all French doors.



(c) **Door
Hardware**

One sash fastener and two sash lifts are provided for each complete window. Each cellar and attic sash is provided with a complete set of hardware, each packed in a box, consisting of a pair of hinges, a fastener and a hook and eye to hold the sash when it is open.

(d) **Sash
Hardware**

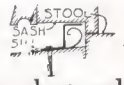


Twelve coat hooks are furnished for each closet.

(e) **Coat Hooks**

All inswinging casement sash in finished rooms are made with a specially constructed bottom rail. This fits over the stool and the sill of the frame. Put on the bottom rail the three member metal weather strip furnished. These sash are very carefully made, so do not plane or cut off any of the bottom of the sash in fitting it to the frame. Cut only on the top, as necessary. A full size detail showing a cross section through the bottom of such sash is shown on the blue prints. This detail must be followed very carefully—not only in setting the sash, but in fitting the weather strips. The joint between the sash and the sill must be absolutely tight or the rain water will blow through. The heavy strip shaped  fits over the tin strip shaped 

(f) **Casement
Sash**

These two are screwed down to the sill together tight and against the stool,

thus . The thin strip  is nailed up to the bottom of the sash, so that when the sash is shut it will fit tightly into the pieces on the sill, like this . All inswinging sash have a catch furnished which

should be put on about the center of the sash, so that it jams the sash tight when locked. When sash are in pairs, a top and bottom bolt is included. These set on the face of the sash, and run into a strike plate. This strike plate must be mortised into the stool and head jamb.

All finish hardware for the bath-room is nickel-plated, so keep this separate from the other hardware.

(g) **Bath-Room**

85—NAILS

In Boxes
and Kegs

- (a) Small quantities of the various sizes of nails are packed together in a box or keg, marked NAILS—MIXED. Each different kind of nail is wrapped separately and marked as to what kind it is. Full kegs of one kind of nails are also marked with the size and kind of nail they contain.

Purposes

- (b) As has been previously explained, certain kinds and sizes of nails are furnished for different purposes. It is necessary to use the right nail in the right place. For your convenience a summary of the uses and sizes of nails follows:

PURPOSE	KIND	LENGTH
Girders and Posts.....	16-penny common.....	3½ inches
2-inch thick Framing.....	16 and 8-penny common.....	3½ and 2½ inches
Sub-Flooring	8-penny common.....	2½ inches
Roof Sheathing	8-penny common.....	2½ inches
Shiplap	8-penny common.....	2½ inches
4" Fir Finish Flooring.....	8-penny casing.....	2½ inches
3" Y.P. Finish Flooring.....	8-penny casing.....	2½ inches
¾-inch thick Oak or Maple Flooring.....	8-penny casing.....	2½ inches
¾-inch thick Oak or Maple Flooring.....	4-penny finish.....	1½ inches
Wood Shingles.....	3-penny shingle galvanized.....	1¼ inches
Asphalt Shingles.....	1-inch roofing.....	1-inch
Tin Roofs.....	1-inch roofing.....	1-inch
⅝-inch thick Ceiling.....	6-penny casing.....	2 inches
Grounds	8-penny common.....	2 inches
Outside Finish.....	8 and 10-penny casing.....	2½ and 3 inches
8-inch Bevel Siding.....	3-penny common.....	2½ inches
4 and 6-inch Bevel Siding.....	7-penny box.....	2¼ inches
Wooden Lath.....	3-penny lath, blued.....	1¼ inches
Metal Lath.....	3-penny	2 inches
Interior Finish.....	6, 8 and 10-penny finish.....	2, 2½ and 3 inches
Door Stops.....	4-penny finish.....	1½ inches
Window Stops.....	3-penny finish.....	1¼ inches
Metal Corners, Valley Tin and Ridge Roll.....	3-penny galvanized.....	1¼ inches

86—EXTERIOR PAINTING

Putty

- (a) All woodwork, except shingles and porch ceilings, on the exterior of the building is to be given three coats of paint. The first coat is a priming coat, composed of white paint (no color) thinned with turpentine and linseed oil. To each gallon of white paint add 1 quart of turpentine and 2 quarts of linseed oil. The second and third coats should be put on full strength. These are furnished in the various colors selected. Putty all nail holes and any other slight defects after the priming coat is dry.

Priming
Outside Finish
and Frames

- (b) In building the house, all outside finish should receive its priming coat as soon as it is put up. Do not wait until it is all up before priming. It is necessary to keep this material dry and not to allow the raw wood to get wet. Window frames should be primed as soon as they are put together and before they are set in the wall.

Painting
Conditions

- (c) Always allow each coat to dry thoroughly before putting on the next coat. Do not do any painting when the surface is wet or during freezing weather.

Paint all gutters and down spouts and any other metal work exposed to view on the face of the building, not including tin roofs or roof flashings, with one coat of metallic paint. After this is dry give it two coats of regular paint in color to match the woodwork. All other metal work not exposed to view is to have two coats metallic paint. (d) Tinwork

Porch ceilings are to be given one coat of linseed oil as a priming coat, followed by two coats of Spar varnish. (e) Porches

Porch floors are to have three coats of special porch floor paint, the first coat being thinned with linseed oil and turpentine to make it work easily. Paint the joints while laying with a thick coat of paint, as described in Paragraph 66-a. (f)

Unless otherwise selected, white paint is furnished for the exterior of all sash. It is also furnished for screens and storm sash when these items are purchased. (g) Sash

Sufficient shingle stain is furnished to allow for dipping all side wall shingles. In dipping shingles, pour shingle stain into a tub or tight barrel. Dip the shingle only two-thirds of the distance from the butt of the shingle. Do not allow the shingles to remain in the stain, but simply dip them in and take them right out again. Make a rack to stand them in while drying, with a trough at the bottom to carry the dripping shingle stain back to the dripping tank. **Be sure to mix stain thoroughly before using.** On some Wardway Homes, factory stained side wall shingles are furnished. On such homes it is unnecessary to do any staining on the job, excepting to touch up any spots where shingles were cut for fitting. A small can of stain is sent along with the shipment of shingles for this purpose. (h) Staining and Dipping Side Wall Shingles

87—INTERIOR PAINTING

All doors and interior woodwork must be sandpapered smooth and clean before any painting or varnishing is done. Do not do any interior painting until the house has been swept and cleaned of all rubbish. Do not allow any work to be done which will cause dust to arise while the interior painting and varnishing is being done. (a) Cleaning

A good plan to follow in filling nail holes in finished surfaces is to take very fine sawdust of the same wood that is to be finished and mix with a small quantity of white glue. Use only enough glue to make the sawdust stick together. Fill the nail holes with this and press it in well with a putty knife. Let it dry and then rub smooth with fine sandpaper. If it is done carefully the nail holes will hardly be noticed. The fine sawdust can be made by rubbing a piece of the wood with fine sandpaper. (b) Filling Nail Holes

The interior trim and cabinet work is to be finished before the floors. Cover all doors and interior trim, cases and cabinets (except in the bath room) with a coat of interior varnish thinned with turpentine. Use 1 quart of turpentine to each gallon of varnish. After the first coat has hardened, sandpaper smooth and add two coats of clear varnish. (c) Varnished Trim

- Enamel** (d) The bath-room is to be finished in white enamel. Give the Keene's cement wainscoting one coat of boiled oil, followed by three coats of white undercoating and then by one coat of white enamel. The doors and all woodwork in the bath-room are to have three coats of white undercoating and one coat of white enamel. Both the undercoating and the enamel are to be put on full strength. Allow each coat to dry thoroughly before applying the next one. Each coat of the undercoating and the first coat of enamel to be sanded only very lightly between coats, so as to smooth out any irregularities. Special care must be taken to put all of these coats on as smoothly as possible. The room in which enamel is being put on should be warm, at least 70 degrees, and the enamel of the same temperature, so that it will flow smoothly. If enamel is furnished for any other part of the house instead of varnish it should be put on as described above.
- Varnished Floors** (e) All floors are to be given a first coat of thinned floor varnish. Be sure to select the can marked FLOOR VARNISH. Thin this with turpentine in proportions of 1 quart of turpentine to each gallon of varnish. After this first coat is thoroughly dry cover it with two coats clear (undiluted) floor varnish. Sandpaper lightly between each coat.
- Cellar Sash and Frames** (f) Paint completely the inside of cellar sash and frames and the cellar stairs with two coats of exterior paint.
- Stain** (g) If walnut oil stain is supplied for the woodwork, apply the stain to the raw or unvarnished wood before varnishing. Apply it with a brush and rub it off with a soft cloth. Do not stain any more than can be wiped off at once. It depends entirely on how much stain you put on and how soon you rub it off after applying how dark the finish will be. Experiment a little with this before starting in by staining a few samples. After the stain is dry cover it with one coat of shellac. Sandpaper lightly. Finish with clear varnish, as described above.
- Oak Woodwork** (h) When oak floors or woodwork are furnished, paste wood filler is supplied. Apply this directly to the raw or unvarnished wood. The paste wood filler must be thinned with benzine. Use 1 gallon of paint thinner to 12 pounds of filler. Apply this and, after it has dried about an hour or less, rub it thoroughly with excelsior or burlap across the grain of the wood. After allowing the filler to dry thoroughly about 48 hours, apply the clear varnish, as described above.

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